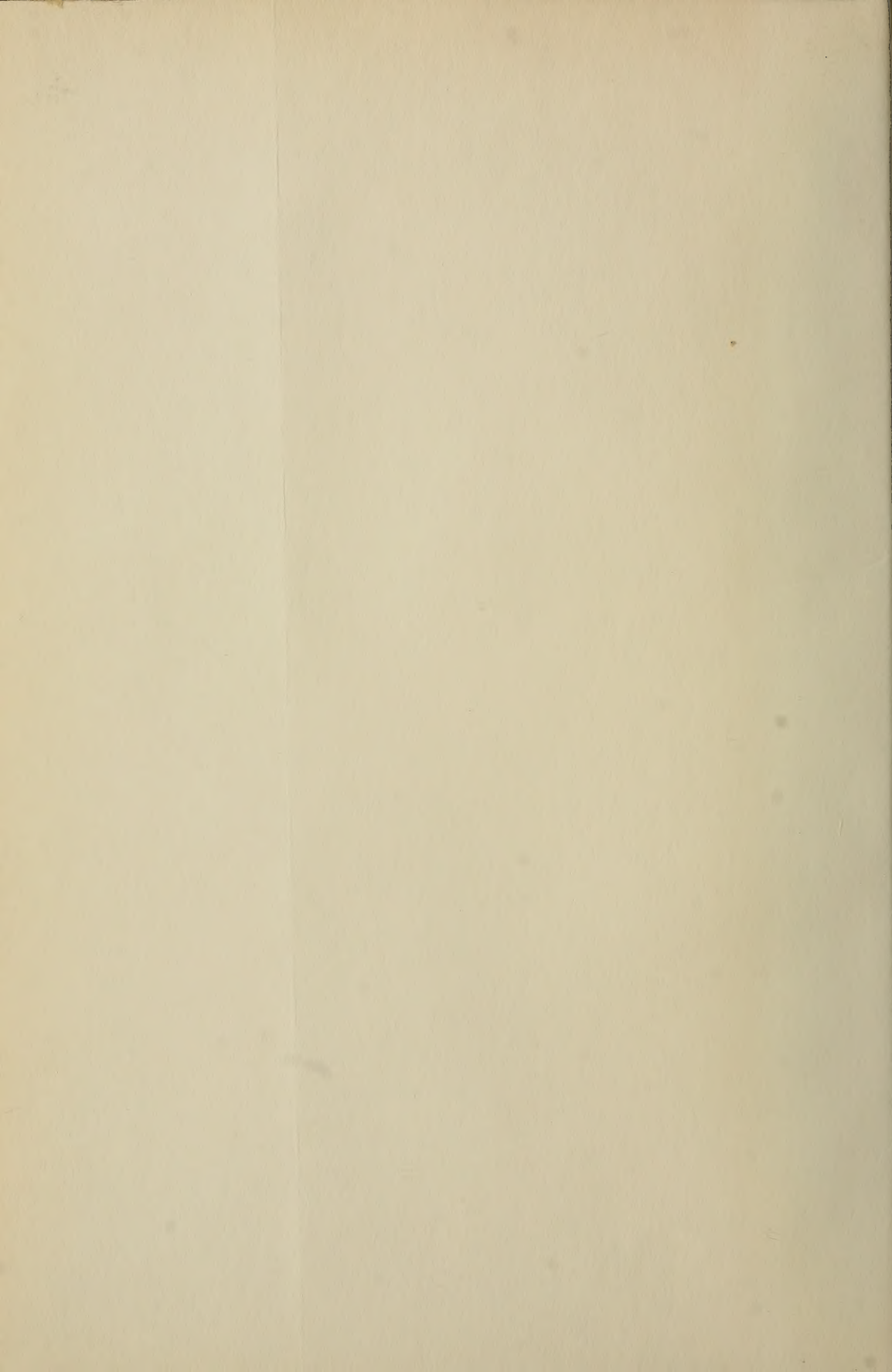










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University of the State of New York

BULLETIN

OF THE

New York State Museum

VOL. 4 No. 18

NOVEMBER 1897

POLISHED STONE ARTICLES

USED BY THE

NEW YORK ABORIGINES

BEFORE AND DURING EUROPEAN OCCUPATION

PREPARED BY

WILLIAM M. BEAUCHAMP, S. T. D.

ALBANY

UNIVERSITY OF THE STATE OF NEW YORK

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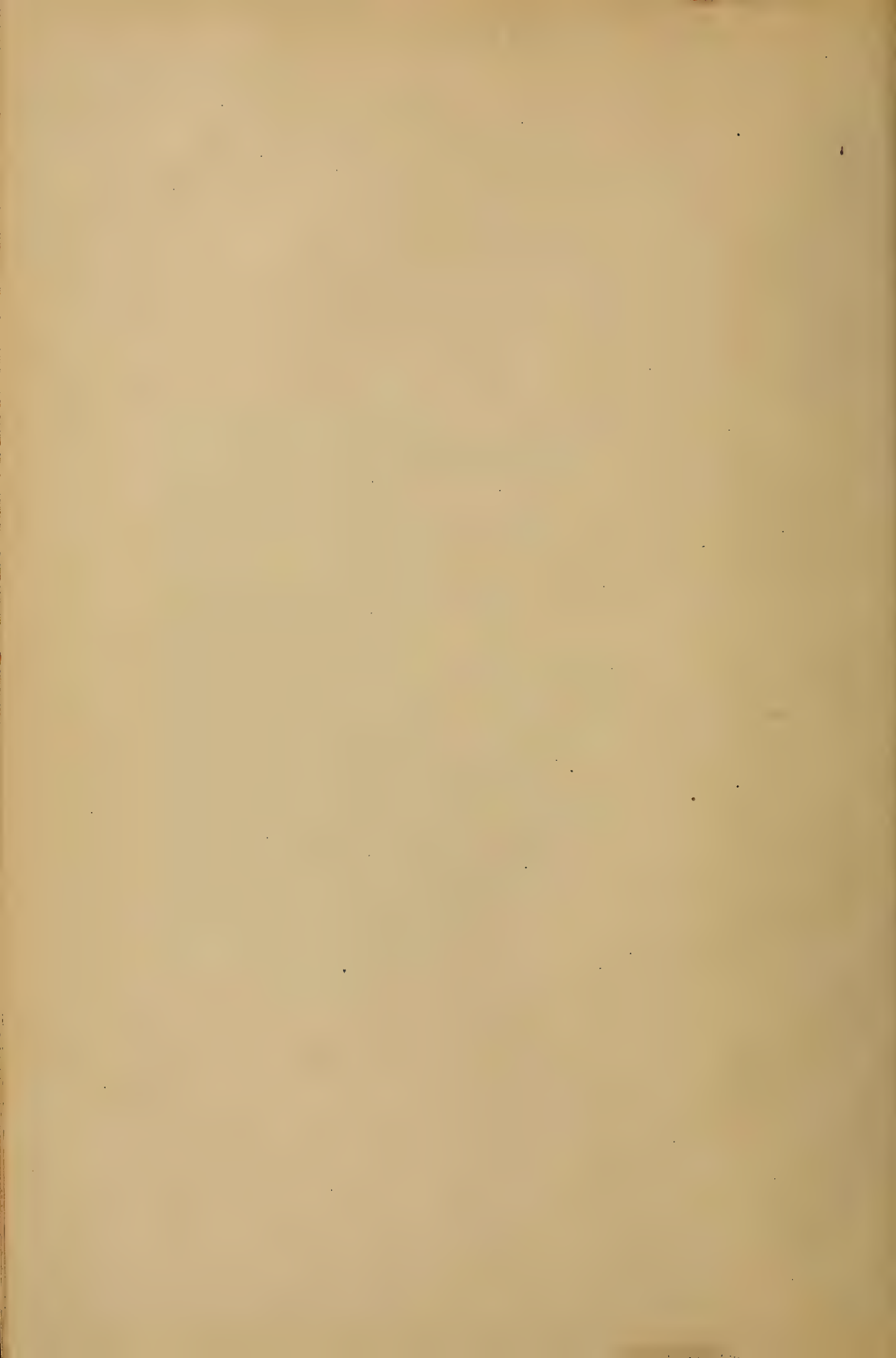
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INTRODUCTION

The preliminary paper on our aboriginal articles of stone comprised those which were simply chipped, and these are much more abundant and widespread than those treated of in this bulletin. The latter, however, show almost incredible patience and skill in their higher forms, as well as taste in selecting materials. They also give hints of superstitions and ceremonies not yet thoroughly understood, and therefore not now discussed. As before, this paper has been prepared and illustrated by the Rev. W. M. Beauchamp, S. T. D., the figures being from his large collection of original drawings, made in nearly all parts of New York, but mostly from the central portion. It is probable that the southwestern counties might add a few forms, as that region included a portion of the mound builders' country, and was a border land. A few illustrations might have been added from other writers, but neither these figures nor the descriptions were deemed accurate enough for the present purpose. Those given have been carefully prepared, and every detail has been represented wherever opportunity was afforded.



POLISHED STONE IMPLEMENTS OF THE STATE OF
NEW YORK

In considering polished stone articles as a class, it is necessary to divide some departments, as pipes, ornaments, and vessels of various kinds, much alike in form and use, but not in material. The modes of manufacturing these, however, are sometimes so different that no farther excuse need be made. Clay and stone specially mark eras in human progress.

Under this head will also be included picked implements, for picking was commonly part of the process of forming polished articles, which are found in all stages of development. The picked implement was rarely finished. Sometimes grinding was the first act of all, but not in general. A few stones, naturally formed for use, might receive an edge at once. More commonly they were chipped, picked and polished as time or needs permitted. This is most frequently seen in the case of celts and gouges, where the same site may yield every gradation, from the rudest to the finest, and sometimes unite every process in one implement.

The number of unfinished articles of a high grade is quite suggestive, many of these being found on small camps, not indicative of long continued residence. Among others, tubes, banner stones and pipes were thus carried about, to be completed in the leisure moments of camp life. Many of the finer finished articles were also carried on journeys, indicating some possible use away from home, more superstitious or common place than ceremonial. Some features of this distribution will appear in considering these. The locality in which others were found will point out modes of travel, and perhaps indicate whence the travelers came.

Some of the best results of New York work, however, will be in determining the age of many articles hitherto undated, and in sometimes assigning them to their true makers. Much progress has already been made in this comparative study, and a thorough exploration of a few well known sites would give valuable results. Several kinds of stone pipes were made only within the historic period, and the red pipe stone of the West first appeared in New

York but little over 200 years ago. Articles of shell have also been sadly misunderstood.

As to material, there are also valuable suggestions in some of these articles of polished stone. The aborigines had taste in selection when they required ornaments, and the Huronian or striped slate frequently appears, a few celts even being made of this. This indicates commerce, for it came from places farther north and west. Travel and traffic existed then as now. Gorgets are usually of fine stone, and are rarely unfinished. As a rule, they were brought here in perfection. For celts, however, any pebble might answer, and many are of ordinary field stones, always accessible to the common people. The abundance of basalt celts, even on recent sites shows a choice in material, and some of the green stones are beautiful indeed. Pestles are often well worked, but yet oftener are slightly adapted pebbles. Some are of great size. Hammer stones survived almost every thing else, but stone balls, used in war clubs by their fathers, are preserved by New York Indians yet. Such features will be more fully seen as we proceed.

When the white man came to New York, the Mahikans and other kindred nations occupied the Hudson River and the seacoast. West of these was the territory of the Iroquois, Andastes and Eries, also of one family. At that period the Iroquois at least used but little stone, nor are the finer early articles found on their earlier sites. As a rule, their pipes were of clay, ingeniously ornamented, and whether they had ever used or made others may be a question. Obtaining suitable tools from the white man, they afterwards made pipes of stone, in a sense going back to the stone age. The delicate drilling of the pipe stone, so often seen, was unattainable with aboriginal tools, and this is true of the small shell beads. Pipes and ornaments were articles of common use, however, and some nations were celebrated for their work of this kind, but we need never forget that most of their finery came from frailer materials. Within the historic period it is probable that many of the New York stone pipes were made by the Cherokees, as in earlier colonial times they were made in New England. Many stone implements, common elsewhere, are notably absent here, showing that some large nations

never penetrated this State. This is the case with the grooved axes and chungke stones. On the other hand the makers of some slate knives, amulets, and other articles here, never penetrated the South. So to speak, there was an aboriginal Mason and Dixon's line.

That many articles required a long time to finish, seems plain, and yet this time may have been overestimated, as in the early ideas of arrow making and other primitive arts. A dexterous workman went on confidently, and his simple tools were sometimes far more efficient than we think. Skill was more than instruments. Sometimes the stone was wrought while fresh and soft, hardening afterwards by exposure and use, as in the case of the Cherokee pipes; but a good flint or gritty stone cut many materials with great rapidity and ease. The fine finish may have been much slower work, reserved for a master hand. Drilling was done in various ways and most gorgets seem to have been perforated with flint. Banner stones were sometimes partially drilled with this, as appears in some unfinished pieces. Sometimes a tubular drill was used, as we find in the same way; sometimes a gouging process was employed. Precisely how the picking was done may be less plain, but effective hard and sharp stones are not rare. Usually it is very neat and uniform even where the material is hard. As polishing was the last process it began with the most essential parts of the implements as the cutting edge, where it often preceded the picking.

That many early implements of polished stone were not used by the later Indians, and indeed were unknown to them, is now well understood. This, like the same fact in chipped stone, points to a great and probably sudden change. They were not perpetuated by descent, nor acquired by conquest, but were simply lost arts, because there were intervals between the early and later comers. The stone gorget, banner stone, amulet, tube, boat stone, slate knife, grooved axe and gouge, had no place at all among the Iroquois, historic or prehistoric, yet all these occur more or less in their ancient territory. These, too, were among the finest of American articles of polished stone, and yet were utterly unknown to them, as far as appears. Thus, whoever was here before their coming had little in common with them, except in the very simplest

things. This difference is so great of itself as almost to prove them a different race, and this appears in other ways. In a broad way the Algonquin family might be included in this view.

Occasionally location has importance in considering probable use. Two grooved boulders in position may materially affect our opinion of their use and origin. The abundance of stone plummets in certain places indicates a local and special purpose. Two forms of polished slate knives may have great ethnological importance, and the almost utter absence of other things points out early differences otherwise unknown. More light still may result from farther research and clearer judgment, specially as comparative study goes on.

There is now little reason to doubt that the use of polished stone in America is nearly or quite as old as that of chipped articles, specimens of the former occurring geologically as early as the latter, if the tales of scientists are true. Indeed the idea of sharpening by rubbing or grinding would be quite as primitive and natural as any other, and it would soon be a question of the best use of material. Stones with a good cleavage would be chipped; those of a different character, ground. Bone or horn are often so well adapted for use naturally or by accident, that the slight grinding required would be at once suggested. Divesting ourselves of all prejudice, it would seem that the two arts would go hand in hand, as was certainly the case in New York. In this State the older polished stone articles are not only the finest, but are often far older than those of flint.

There was a period of decadence in polished stone work in New York before the coming of the white man. Shell, bone and horn had taken the place of some things, and clay of others. The stone pipe had largely disappeared and the polished stone axe or celt was almost the only fine article surviving in pristine beauty. These were soon to pass away, but steel tools occasioned a revival of ornamental stone work. Pipes of this material were made again; pipe-stone came east through the wars of the Iroquois, and was delicately wrought and drilled in great quantities, often by the white man's taste and skill; always with his tools. Small shell beads were made and distributed in prodigious numbers through the same means, but the flint arrow and stone axe utterly disappeared. The

return to the stone age, such as it was, came through the white man and not through the red.

It often happens that a number of stone articles can be assigned to one maker, as certainly as we can tell who made an old violin, although we know not his name. Things hundreds of miles apart will be found of some peculiar material and form, which can hardly be accidental. They will not be many in number, but they will have individual character. We recall many such. The skilful aboriginal artificer was as highly honored as any among civilized men, and his work had a wide reputation. In other lands early records show this in words which we can read. Here the record exists only in stone.

Usually articles which required much drilling of any kind, were blocked out before this was done. Thus all percussion was avoided after the perforation was complete, while sufficient material was left to allow for any deviation from right lines in drilling. Grinding and polishing then safely proceeded. Polishing and perforation sometimes went on together with disastrous results, a break in the surface spoiling the pipe or banner stone. The extent to which this drilling was carried is often surprising and the same may be said of its accuracy, specially when, as in many tubes and banner stones, it was made from both ends, meeting in the center. In its way it was as great a feat as some modern tunneling. Rarely does it deviate from a straight line.

CELTS

The grooved axe, as will hereafter appear, is rare in most of New York, and its place is supplied by some of the many forms of celts, often known as deer skinners. These are occasionally roughened toward the upper part of the lateral edges, to give a better grip to the handle. These axes were in use when Champlain encountered the Mohawks on Lake Champlain in 1609, although some had already obtained iron axes from the traders, who had frequented the lower St. Lawrence for more than 70 years. He was surprised that they could do so much with such poor tools, and these must have been far more effective than most antiquarians have thought, for in this instance fire was not used. He said they 'began to hew

down trees with villainous axes, which they sometimes got in war, and others of stone, and fortified themselves very securely.'

Usually, according to David Cusick, fire was applied to trees, and when these were felled, fresh fires were kindled where these were to be cut off in lengths. The fire was the active agent; the celt or stone axe was employed in scraping away the charred wood. Each woman had several fires to attend, and the work was done quite rapidly. At Onondaga now, the Indians use the same means in hollowing out the large wooden mortars still used by them. Burning and chipping go on alternately, a process familiar to our own early settlers.

The mode of handling is of interest, but was not always the same, and many ways have been described. Fig. 1 presents one remarkable and antique example. It is a celt of the common rounded form found in the peat and muck at Chittenango Creek long ago, seven feet under ground. It is the only ancient handle locally preserved, and has suffered much from age yet it is still fifteen and one half inches long by two and one quarter broad. It tapers from the axe to the end of the handle. The orifice in this is shown at *b*, and has evidently been finished, at least, by heat. In this the fine greenstone celt, elliptical in section, exactly fits. This is five and three eighths inches long and two wide, the form being quite common. It was dug up in excavating for the canal feeder.

Fig. 2 is an angular form of brown sandstone, found in the town of Cicero, four and five eighths inches long by two and one eighth wide. This form seems more frequent in New York than elsewhere, and is from four to six sided in its varieties, the angles never being rounded. One of the surfaces is always broad and flat, and two of them meet the others at a broad angle. They are somewhat common at Onondaga and Oneida lakes.

Fig. 4 is of an unusual form and material, being a very broad and flat celt of green striped slate, three and three quarters by three and one eighth inches. The outline is much like that of a modern axe, and it is much twisted in section. This was found, with a similar one, at Jack's Rifts, on the Seneca River.

Fig. 6 is a chisel of brown sandstone, almost cylindric, but with several flattened sides. These sides are nearly parallel. It is five

and five eighths inches long and one and one eighth inches wide, with neatly rounded ends. It is a rare form, and was found at Baldwinsville.

Fig. 7 is also a somewhat rare, but widely distributed form. It is flat or nearly so on one side, and more convex on the other. They usually have a broad cutting edge at one end, and are rounded at the other. This one comes to a sharp point, and is rounded and sharp at the broad end. It is of grey sandstone, three and one eighth by nine sixteenths inches and comes from Wood Creek, east of Oneida Lake.

Fig. 8. is of the normal form of this type, and is of brown sandstone, four by three quarters inches. It is sharp at both ends, the more pointed one being rounded, and comes from Baldwinsville, where they are somewhat frequent.

Fig. 9 is of green striped slate, and approaches the boat form. The ends are rounded and sharp. It is four and one eighth inches by three fourths deep, and comes from Chittenango Creek. There are many of this form, but their use is not clear.

Fig. 10 is another of the angular celts, and a still rarer form. It is of brownish drab sandstone, eight inches long by two and one eighth wide, and of a tapering form. There is a raised medial line on each broad surface, which, for half the length, has been gradually ground down to the broad cutting edge. The small end is brought to a neat point. Angles like these are hardly rare and yet are seldom so pronounced. This comes from the village of Baldwinsville.

Fig. 11 is a small black basalt chisel, angular and sharp, two and one eighth inches by one fourth broad. It is a very neat specimen of these small implements, and comes from Seneca River. Fig. 12 is another of these small celts from the same place, but thicker and more ridged on one side. It is of greenstone, two and one quarter inches long by three eighths wide. These are not rare.

Fig. 13 is a larger form of black basalt, triangular in outline, and with angular edges. It is three by one inches, and was found near Syracuse.

Fig. 14 is a handsome black and angular celt, with convex edges and somewhat rare form, three and seven eighths by one and seven

eighths inches wide, polished and from the Oneida River. Fig. 15 is also not a common form. It is nearly triangular and of light olive green slate, two and three fourths by one and one half inches. It is both thick and sharp, and has a very convex edge and comes from Seneca River.

Fig. 16 is much like one before described, and was found with it. It is of dark green striped slate, four and one half by two and one half inches, and is longer, narrower, and less twisted than the other. They are of moderate thickness, and no others have been reported at all resembling them.

Fig. 17 is a curious quartzite celt from the Mohawk River, being highly ornamented with lines and circular indentations, and having both sides thus carved. It is two and one quarter by one and one half inches. Celts are often thus ornamented, though not so profusely as this.

Fig. 18 is small, thin and symmetrical, with a cutting edge at each end. This feature is hardly rare, and appears in much larger specimens. This implement is but one and three fourths inches long by one half wide, the flat sides neatly curving to the sharp ends.

Fig. 18a is another very broad black celt of small size, one and three quarters by three quarters inches. Both are from Seneca River.

Fig. 19 is of grey sandstone with indented edges, and rather flat. It is five and one half inches long by two and one quarter broad, and was found at Onondaga Lake.

Fig. 20 is a beautiful and remarkable celt of green striped slate, from Onondaga Lake. It is quite broad, being two and one fourth by one and one half inches, and is remarkable for a depression across the surface half an inch from the edge, which has a flat grinding below this. It seems unique. Fig. 21 is grooved in a very different way, having three grooves across the back. It is thick and flat, of light olive green slate, and is five and one eighth by two and three eighths inches. It was found by the Oneida River, at Caughdenoy.

Fig. 22 is peculiar in many ways, having grooved lines lengthwise and across. It is four and one eighth by one inch, and comes

from the Thousand Islands. Fig. 23 is from the St. Lawrence River, and is one of the long and slender celts, widest in the center, flat on one side and curved on the other. The ends are rounded. It is of striped slate, six and seven eighths inches long, seven eighths wide and five eighths deep. Fig. 24 somewhat resembles this, but is more distinctly a double edged celt, being quite sharp at each end. One side is slightly but not conspicuously flattened, and a groove extends nearly around it. The other side is more rounded. It is of polished brown stone, three and three eighths inches long by one inch wide, and comes from Fleming, Cayuga County. Fig. 25 is of the same class, small and narrow, with curving sides. One surface is flat, the other raised, and while it is sharp only at one end, the other comes nearly to an edge. The form is wide spread but not common, and some specimens approach the boat stones in general outlines. They are usually of slate or fine sandstone. This one is from the Oneida River, and is two and three eighths by five eighths inches wide.

Fig. 26 is reduced in size with the nine which follow it. It is of a rare and peculiar celt, several of which have been found. They are very slender, usually nearly cylindric, and more or less pointed at each end. Sometimes the material seems too frail for use. This is one of the larger specimens, and $11\frac{1}{2}$ inches long. The diameter is one by one and one fourth inches. It is angular and four sided, but the angles are rounded, and the points likewise. It tapers to each end, and shows no signs of use. The material is a polished dark gritty slate, from Seneca River.

Fig. 27 is another of the same general form, nine inches long by fifteen sixteenths thick. It is of a dark brownish steel grey, and is pointed at both ends. It was found near the Willard Asylum on Seneca Lake. This is of about the average length, but some are longer, and others more slender.

Fig. 28 seems an adze, and will be described under that head.

Fig. 29 is an unusual form of celt, contracting toward the point. It is made of green variegated slate, three and one half inches by one and one eighth wide, and is narrow and rounded at the cutting edge. It comes from Seneca River.

Fig. 30 might be classed as an adze. One surface is nearly a plane, and the other curves to each sharp end. It is of sandstone, nine and seven eighths inches long by one and three eighths deep, the width slightly exceeding the depth. It is from Brewerton, and a rare form for the size.

Fig. 31 is a small celt of variegated grey granite, from Van Buren. It is one and five eighths inches long by one and one eighth wide, and is quite flat on one side. Fig. 32 is larger and less angular, but of the same broad form. It is of a highly polished dark green marble, almost black, two and one eighth by two inches wide, and rather thick. The edges are rounded, and it comes from Seneca River. Fig. 33 is another of these small celts, made of black basalt and moderately broad. It is one and one half inches long by thirteen sixteenths wide, and comes from an early stockade on the Seneca River.

Fig. 34 is of black basalt, and is from a recent stockade in Pompey. It is an Onondaga implement used about A. D. 1630, and interesting in this way. It is thin, flat and angular, five and three eighths inches by two wide, and the edge is abruptly ground. It was found in 1878.

Fig. 35 is another of the small broad celts, from a place on the Seneca River where many of this form have been found. It is of basalt, one and three fourths inches by one and five eighths wide, the extreme width almost equaling the length.

Descriptions are added of a few celts not figured here, but all of which are described and illustrated elsewhere.

A fine angular and rather flat celt of black limestone is from Brewerton, and is nine inches long by two and three fourths wide. It has a fine polish and sharp angles, the latter being quite common with this form. Another, from the same place, is of black basalt, and almost triangular in section. It is quite large, being $11\frac{5}{8}$ inches by two and three fourths wide. A fine angular celt of grey sandstone is also from Oneida Lake, and has a narrow back and sloping sides. Many of this peculiar form are found near there. This is five inches long by two and three eighths wide. Another of this frequent angular form is of basalt, and comes from the Seneca River.

It is three and three fourths inches long by one and three fourths wide.

A fine celt of light olive greenstone is from Skaneateles, and is seven inches long by one and five eighths wide, being narrow for its length. A long triangular celt from the Seneca River may have been an adze, and is much ridged on one side. It is eight and five eighths inches long by two and three fourths at the widest part.

One interesting example is of a celt of brown sandstone, the edge of which has been broken. At some distance from this the implement has been nearly half cut off, in order to form a new edge. The original length was five and five eighths by two and five eighths inches wide. It is from a much frequented site at Onondaga Lake.

Very many fine celts are of a mottled greenstone, and usually not angular, being of the general form of the first figure given. Two beautiful examples of these from the Seneca River are each five inches long by two and one quarter broad. This is a frequent form and size. One of dark greenstone, thin and flat, from Onondaga Lake, is perforated at one end, and like implements occur elsewhere. This article is four by one and one half inches, and all the edges are convex. Several double edged celts are from two and one half to four and one half inches long.

A grey quartzite celt, from Three River Point, has a slight roughened groove entirely around it, which is picked as well as the battered end. The size is eight by three inches. Of course this occasional groove or roughening was not needed in small celts. A curious one from the Oswego River has notches on the lateral edges like those of sinew stones, and reaching nearly the whole length. A perforation had also been commenced. The implement is four and five eighths by one and five eighths inches wide. Another from the same place is remarkable for having the date of 1700 upon it, as much weathered as any part. The edge is broken, and it tapers quite to the upper end. It is of ferruginous sandstone, five inches by two and one half wide. Another from the Seneca River has also transverse grooves on the edge. This feature is hardly rare. It is of a light grey and quite hard stone, three and seven eighths inches by two wide.

About half remains of a large celt found on the Seneca River, and made of polished greenstone. The fragment is now seven and one fourth inches long by three and five eighths broad, and is two inches thick. There are few New York celts as massive as this. One of the four sided angular celts from Oneida Lake is of light drab sandstone, and has the lower surface or back about half the width of the upper, which is a frequent proportion in these. It is nine and three eighths inches by two and seven eighths on this broad surface, and is correspondingly thick. Another from Brewerton has all the angles rectangular in section, and is about half as thick as wide. It is eight and one half inches by two and five eighths broad. One from Van Buren made of polished black basalt, nine and five eighths by two inches, has the upper side angular, and the lower side partly angular, partly rounded. Occasionally a celt is very broad, as is one of mottled greenstone from Onondaga, which is three and five eighths inches by two and three eighths broad. The general outline of this is a broad ellipse.

A frequent form, but of polished green slate, comes from Seneca Lake. It is almost pointed at the top, but moderately thin and generally rounded. It measures five and three fourths inches by two and one eighth wide. A larger angular one, from the same place, has the ends rounded, and one broad surface as usual. The sides are sloping and the back narrow. It is of grey slate, ten inches long by two and one half wide. An angular six sided celt from the Seneca River, is of a hard grey stone, five and one fourth inches long by two and one half broad. A broad celt of greenstone from Cayuga County, straight on one side and curved on the other, may be an adze. It has a central perforation, much enlarged on both sides. It is five and one half inches long by two and three eighths wide, and is one and one eighth thick. It is a rare form in every way. One of the narrow celts, flattened on one side and raised on the other, and suggestive of boat stones, comes from Binghamton. It is nearly sharp at both ends, and is four and three eighths inches long.

Several of the long cylindric celts have been found in various places, and among them is one of black slate from Schoharie

County. It is slightly angular, having a distinct edge on each side. One end is rounded, with a very narrow cutting edge at the other. It is nine inches long, with a maximum thickness of one inch. Another of brown sandstone, slightly flattened, is from Cayuga County. It is eight and three fourths inches by one and one fourth thick. The ends are rounded, terminating the tapering surface. Still another from Elbridge is very fine and slender, being now $11\frac{3}{4}$ long by one inch broad. It is of sandstone, and apparently about an inch has been newly broken from one end. It is circular in section, and tapers as usual, but seems unfitted for any use as an implement. All these are certainly very curious.

A large celt from Plattsburg has two knobs on the back, or rather projections. A large gouge from Oneida County has similar features. These may have been left for attaching a handle. The celt is quite angular and thick, and is nine inches long by two and one quarter wide. This feature is rare. The largest perfect celt brought to our attention is from Jefferson County. It is of greenstone, and is $13\frac{1}{2}$ inches long by three and one fourth broad. Another large chipped one, from Plattsburg is 11 inches long by four and three eighths wide.

A fine angular celt of grey stone, from Three River Point, is quite thin, with one side flat and an expanding edge. It is four and three fourths inches long. A single celt of white marble has been found on the Seneca River. It is somewhat angular, and is four and one half inches long by two wide. Only one soapstone celt has met our eyes, and this came from the same river. Although angular, it is neatly rounded and finely polished, with an expanding edge. It is three and one half inches by one and one half broad. An article of soft red iron ore has the celt form for convenience merely, the grinding and cutting showing that it was used for paint.

One form, which is not frequent, is of a cream colored stone, very light in weight, first chipped and then finely polished. They occur mostly on the Seneca and Oswego Rivers. One from the former is four inches by two and one fourth broad, but they are usually narrower, forming a long ellipse. Another, a little differing from these, is from Oswego Falls, and made of a light chalky stone, $10\frac{1}{4}$

inches long by one and one half wide. It seems scarcely hard enough for much use, but the yellower ones are of a finer and harder grain, although so light in weight.

In Mr. A. E. Douglass' collection, out of 721 celts 85 are from New York, and about half of the smaller forms termed chisels. Dr. Abbott figures one New Jersey celt with a distinct groove, a frequent feature in New York, where all forms are abundant, some being local and unique.

GOUGES

Stone gouges are mostly found in the Atlantic States and are somewhat local there. They might be distinguished as the long gouges, tapering and evenly grooved from end to end; long gouges grooved part way; and broad gouges, distinguished in a similar manner. This would be but a broad classification. Long gouges have been found in Pennsylvania, although rare there. Dr. Abbott figured but one in New Jersey, where they are also rare. Two like his Fig. 140 have been found at Oneida Lake. In Saratoga County and vicinity, Mr. Wagman procured 29 gouges, the largest nine and one half by two and one half inches, and none of them were wider. He catalogued also adze gouges, probably meaning the broad forms.

Mr. Douglass has 85 gouges and adzes, of which 16 came from New York. Those in Central New York are mostly from Seneca River, Oneida, Onondaga, Skaneateles and Cross Lakes. They are most common near lakes and streams, and this makes it probable they were used in making canoes out of trees before bark was employed. They were unknown to the Iroquois. Out of 75 before us, more than one third are the long gouges, grooved from end to end, and tapering uniformly. Some are superb specimens.

Fig. 36 is a gouge of a beautiful light bluish striped slate, of unusual form and probably the finest known in this material. It is flat above and moderately rounded beneath, having a groove extending nearly half the length. The thickness is quite uniform throughout. It is seven and three eighths inches in length and two and one eighth wide, and was found near the Oneida River. It would hardly seem that it could have been employed in any common use.

Fig. 37 is a broad and flat gouge of brown hæmatite, from Van Buren. The broad depression is carried from end to end. Most of those of this form are of the same material, which is quite smooth but shows abundant pits with the polish. On this one an Indian and arrows have been marked with a fine point, doubtless by a much later hand. It is three and three fourths by two and one fourth inches wide, a common size.

Fig. 38 is a small gouge of the long variety, made of brown sandstone, three and three eighths by one and one half inches. It is from the north shore of Oneida Lake, and is grooved from end to end. Fig. 39 is also a small one, probably originally much like the last. It seems to have been broken, and then ground down to a celt-like edge, having part of the groove unchanged. Others occur where this has been done. This is of black basalt, and was found at Brewerton. The top is probably unaltered, and the present size is two and seven eighths inches by one and one fourth wide. For most purposes it is a gouge still. Fig. 40 presents the same feature, very little of the groove remaining. It is of grey sandstone, now flattened by this secondary work, and is four and five eighths by one and three fourths inches.

Fig. 42 is a very broad gouge from the vicinity of Oneida Lake, made of greenstone, and six and one fourth by two and one half inches. The broad groove is but two and one half inches long. Fig. 43 is much like this at one end, having a groove of similar outline. At the other end, however, the lines of another groove take a reverse sweep. Both ends are depressed. The material is greenstone, mottled with white, and the dimensions are four and three quarters by two inches. It was found near the Oswego River.

Fig. 45 is a fine long gouge of the usual size and form, from Oneida Lake. It is of black basalt, eight and one quarter by two and one quarter inches. Some others there were much larger. These long gouges are frequent, varying from four to ten and one half inches long, and they are always finely finished, but are not so common as the other forms. They occur throughout the St. Lawrence drainage in the East.

Fig. 54 is one of those we have termed long gouges, but it has a broad smooth groove across the back, not unique and yet a rare

feature. It is one of the finest examples of the kind, and is made of dark olive green slate, five by two inches. It was found on the Seneca River, west of Cross Lake. Fig. 55 has a somewhat similar dorsal groove, and is of ironstone, with a sharply ridged back, beveled down to the cutting edge. In section it is triangular, and the dimensions are four and one eighth by one and seven eighths inches. It was found near Cayuga Lake.

Fig. 61 is a broad gouge of rare form, closely resembling that of some celts. It is a handsome mottled stone four and one eighth by two and three eighths inches, and comes from the Oswego River. The back is ridged, and the central part of the upper surface at first slightly depressed, then quickly hollowed to the edge. Both ends are neatly rounded.

Fig. 72 is a reduced illustration of a curious implement combining the celt and gouge. The groove extends about half way from one end, while the other, which is broader, has a chisel edge. Toward the gouge end it is three eighths of an inch thick. It is picked and ground, and the dimensions are two and three fourths by one and three fourths inches. It comes from Seneca Lake.

An angular gouge of green gneiss from Jefferson County, has an angular groove, ending squarely at the upper end about midway in the implement. This is an unusual feature. It is six sided in section, nine and one eighth by one and three fourths inches wide, and is every way a remarkable article. Another large and curious gouge is from South Lake, Herkimer County. It is of black ironstone, and has a deep and long secondary groove in the center, with finer ones on either side of this. The length of the implement is $12\frac{1}{4}$ and the breadth two and one fourth inches.

Usually dorsal grooves are confined to the long gouges, but one from Brewerton, having the gouge cavity about one third of the length, has a broad and deep groove across the back, with a broad and shallow one above this. The back is somewhat flat, while the front is much curved. It is of light cream colored limestone, four and one quarter by two and three eighths inches wide. A long gouge from the same place is much contracted at the upper end, and is picked all over. It is of sandstone, six and seven eighths

by one and one half inches. A long gouge of black basalt from Skaneateles has a bulge in the back, but no dorsal groove. It was found in 1884 and is five and three eighths by two inches. Not far from this, in Spafford, a broad and thin ironstone gouge is three and seven eighths by two and one eighth inches.

A curious gouge of black basalt, from Oxford, has several knob-like protuberances on the back. The dimensions are seven and one half by two and three fourths inches. A long and deeply hollowed gouge from Oneida River, three and five eighths by one and five eighths inches, has two grooves across the back; and Pompey furnishes a long gouge of greenish grey stone, with the same feature. This implement is thick, but not of great length, the dimensions being four by one and seven eighths inches.

One beautiful long gouge from the Oneida River is of red slate, a very unusual material. It is seven and three fourths by two inches. One of black basalt from Cross Lake is both large and fine, being $10\frac{1}{2}$ inches long and two and one half wide. Another of greenstone, from the Oswego River, is of a long tapering form, flat above. This is nine and three fourths by two and one half inches.

Broken gouges are frequently found. Fanciful uses have been ascribed to them, but it can hardly be doubted that they were employed in aboriginal carpentry, the shorter forms being often fitted to handles. In making the dug-out canoe they would have been very useful. The wide difference in material and form, however, suggests artisans of differing nations, but they were probably used only for a very limited time, as they certainly were confined to a moderate area. The makers have left so few traces that little can be conjectured regarding them. Only this we know, that they had no practical relationship to the later Indians.

ADZES AND HOES

Stone hoes and spades were but sparingly used in New York, as other materials were employed in the rude agriculture practised here by the aborigines. Loskiel says that the Delawares and Iroquois 'used formerly the shoulder blade of a deer or a tortoise shell, sharpened upon a stone and fastened to a thick stick, instead of a

hoe.' The Mohawks used wooden hoes. Corn, beans and squashes were the staple products, and rude implements sufficed for these. Some celts may have been adzes.

Fig. 28 is a curved celt-like implement of polished sandstone, from the east end of Oneida Lake.

The sharp end is almost pointed, while the other is rounded somewhat like a ball. This may have been used as a pick or a hoe. It is nine and one fourth inches long and one and three fourths thick, being reduced in the illustration.

Fig. 66 has been called an adze, spade or hoe and is a rare form in New York. It is of polished black slate, somewhat triangular in outline, and having a groove across the surface about a third of the way from the top. Below this is a large circular perforation. The size is four and one half by three and three quarters inches, and it is said to have been found near Canoga, on Cayuga Lake. It is a western form, and finely finished.

STONE BALLS

Stone balls were often employed by the Iroquois in the heads of war clubs, a hard knot sometimes serving the same purpose. Some Onondagas still preserve such stones used by their ancestors. They occur moderately on most Iroquois sites, whether early or recent, and generally show irregular facets, though sometimes quite globular. They are not usually large, but in one instance at least the size is too great for a war club. They are occasionally grooved, and many elliptical pebbles occur with this feature, which were probably sinkers, and had no relation to warfare. These are abundant on some lake shores, notably those of Cayuga and Seneca. In the West stone balls have been used by the Indians somewhat like slung shot, and they were well known as bolas in California and elsewhere. In New York the more elaborate stone balls may be considered recent. Although perforated stones have been said to have been used as weights for fire drills by the Iroquois, there is no proof of this in early days, as they do not occur on Iroquois sites; and a mistaken impression has been gathered from Morgan, who makes no mention of a stone in describing the fire drill.

Fig. 47 is a small, black and polished ball, out of a large quantity found together in an Indian cemetery at Dresden, on Seneca Lake. One of these is an inch in diameter, and another a little larger. They are not quite a perfect sphere. Fig. 53, from a stockade on the Seneca River, closely resembles these, and is an inch in general diameter, but is a little oblong. It is black and polished, and is quite heavy.

Fig. 49 is one of the larger balls, probably used in war clubs. It is of polished quartzite, naturally grey, but stained dark and with russet streaks. A distinct flattened zone encircles it one way, but is not conspicuous, and there are obscure facets. The diameter is about two and one eighth inches. This comes from the Onondaga town of 1696, near Jamesville. A large granite ball, one foot in diameter and worked all over, comes from the same place. It may have been used in games.

Fig. 51 is a ball of pink quartzite, faceted, picked and ground. There are four facets on opposite sides, and another begun. It is two and one half inches in diameter, and was found on a village site near Baldwinsville.

A polished brown sandstone ball was found near Amboy, which was covered with red paint, and was three and one fourth inches in diameter. A very irregular faceted one of brown sandstone is from Indian Hill, occupied by the Onondagas in 1654. It is two inches in diameter, and ground but not polished. One of picked ironstone was long in the possession of the Webster family, on the Onondaga Reservation. It is two and one fourth inches in diameter, and a little irregular. Many such balls are found in Cayuga County, where oblong grooved pebbles also occur. A large grooved ironstone ball, on the Onondaga Reservation, is unpolished, and three and seven eighths inches thick. A spherical one comes from Indian Hill.

Near Baldwinsville they are frequent on fortified sites, and elsewhere. One of light greenstone, from the double walled fort, has distinct facets, and is one and three quarters inches in diameter. Another, from the same place, is of light greenstone and has irregular facets. The diameter is two and one quarter inches, and it is

a little flattened. Many more might be described, but they present no very different features. The largest of these is three and three quarters by two and one quarter inches, and is of flesh colored granite.

Among the grooved pebbles is a long one, closely resembling one from Wyoming. It is grooved all around from end to end, the length being three and three quarters and the width one and three eighths inches. This is classed among the sinkers, which usually have the groove around the shorter circumference in New York.

A figure of a perforated ball of polished yellow granite was omitted from some doubt of its character. It was obtained near Cross Lake some years ago, and two and one eighth inches in diameter by one and five eighths inches. The perforation is countersunk at each end, the general diameter is a quarter of an inch, and it is neatly drilled. In 1897, however, Mr. A. G. Richmond received one of these from Otsego County, of which he says, 'This is a smooth stone, about two and one half inches long, one and three quarters in diameter, and with a hole lengthwise a quarter of an inch in diameter. It is something so unusual for this part of the country that I desire to call attention to it. It was a surface find in that county.' The two articles so closely correspond in size and character that they may be classed definitely among New York articles; the principal difference being that the first mentioned is drilled through the short diameter. Mr. Richmond would place them with the South American bolas, but the perforation of so hard a stone would suggest some other use. The figure is so simple as to be readily understood without illustration.

ORNAMENTS

For convenience in arranging illustrations, some of the small ornaments are not placed in consecutive order, but will be found at intervals among the rest. Early stone ornaments, aside from those classed as amulets, gorgets and ceremonial stones, were usually of slate, soapstone and sandstone, and were not many in number. Other things were more available and made more show. A little before A. D. 1700, catlinite, or red pipestone, was brought east in

small quantities, and soon became quite abundant. It assumed many forms, and was commonly delicately perforated for suspension, often having a double parallel perforation for the purpose of keeping it exactly in place. By this time the Indians had many steel tools, and handled them with native taste and skill, fashioning many simple ornaments for themselves. They became good gunsmiths, good silversmiths, and spared no time to make an article good. Plain circular ornaments, which were often but flat rings, were favorites, and these must have been laid out with compasses, which they had very early learned to use. Many articles were straight sided, and almost pyramidal in outline. Some pieces of stone were wrought into fishes, and others into human masks, often very small in size. Any ornamental form was useful, and some were derived from the whites. The gradual change in ornament is easily seen, particularly on the historic sites in the counties of Cayuga, Montgomery and Onondaga.

Fig. 5 is a characteristic example of the red pipestone ornament, nearly one and one half inches long and over three quarters wide at the base. It is less than a quarter of an inch wide at the narrow end, and there are small and shallow indentations all along the two longer edges, and on both sides. A double perforation extends from end to end, and is very small. This is from Oneida Lake. Fig. 41 is of the same material, and is of a dagger form, with a long groove on the face. It is a little over an inch in length, and comes from an Oneida site near Munnsville, in the vicinity of which the Oneidas long dwelt.

Fig. 44 is of an older and more curious article, from a site occupied by the Onondagas about A. D. 1600. It is a piece of sandstone almost square; in general appearance like the nut used with a screw. It is perforated like that, and is slightly convex on one side and concave on the other. One broad surface is grooved. The diameter is one inch.

Fig. 46 comprises figures of three stone beads, made of small drab colored concretions, from Chaumont in Jefferson County. Fig. 52 shows more from the same place. They are more commonly made from some perforated fossil, like the encrinite stems,

known in Scotland as St. Cuthbert's beads. Fig. 48 illustrates another and larger kind by two views. Natural concretions often become rude ornaments.

Fig. 50 is a heart-shaped ornament of sandstone from Oneida Lake, perforated near the top for suspension. Length seven eighths of an inch. Fig. 57 is a triangular ornament of red slate from Cayuga. The edges have a concave sweep, and it is less than an inch long. Fig. 56 is from the same vicinity, being a large pipe-stone ornament, with two perforations as in a gorget. It is rounded at the ends, and the sides are nearly parallel. It is flat and of moderate thickness, and the groove is parallel with the edge, except at one end. The length is three and one half and the breadth one and one quarter inches. Fig. 59 is of the same material and from the same county. It is a flat rectangle, with a circular central opening, and one perforation for stringing. Diameter a little over an inch. Fig. 60 is a flat truncated pyramid in outline, and from Onondaga County. It is perfectly plain, and has one longitudinal perforation. Length one and five eighths inches by one and one eighth wide.

Fig. 58 is a figured pendant of red slate from Cayuga. It is a circular disk, perforated for suspension at the edge, and adorned with irregular lines on each side. Carved disks and pebbles are usually recent. The diameter is one and one fourth inches. Fig. 82 is a flat ring of pipestone, one inch in diameter. These are common, as well as some of the forms already figured.

Fig. 84 is a long parallel sided article of light drab slate from Fish Creek, east of Oneida Lake. The ends are rounded, with a perforation near each. It is flat and polished, and the length is one and three fourths inches. Fig. 87 is a small four-pointed star of pipestone, with rounded ends. It was found at Oneida Lake, and is eleven sixteenths of an inch from point to point.

Fig. 88 is of three rude stone beads from Cayuga Lake. Two of these are flat, but the smallest is thick.

Fig. 126 is a small notched and polished pebble from a stockade site on Seneca River. The material is greenish slate, and except in size and finish is precisely like the flat notched sinkers. Long

diameter eleven sixteenths of an inch. Fig. 127 shows two from a recent Cayuga site, a very little longer, but otherwise like the last. The use is conjectural.

Fig. 138 is a straight sided but tapering flat ornament of pipestone from Cayuga. It is two and three sixteenths inches long, and very narrow. Fig. 148 is of the same material and from the same locality. It is a rectangular disk, with a central circular opening, and two small perforations; one on each side. Fig. 149 is another long pipestone ornament from Munnsville, with straight converging sides. Fig. 150 is rarer, but of the same material and from the same place. It is a small trefoil, showing a human figure on one surface. Length thirteen sixteenths of an inch.

Fig. 162 is a remarkable article from a much frequented early site on Onondaga Lake. It is a cup-shaped highly polished pendant of brown sandstone, perforated at the base for suspension. The inside distinctly shows the work of the rimming tool, but the outside has been carefully polished. It is nearly an inch in diameter, and seems unique here. A similar broken one has been found in California.

Fig. 181 is one of the pipestone ornaments with converging sides, but differs from most in rising to a ridge in the center of each surface. There is a central longitudinal perforation. This is also from Cayuga County. It is two and one eighth inches long by a little over an inch broad. Figs. 182 and 183 are small dagger-shaped ornaments of pipestone from Munnsville; the latter perforated for suspension. Fig. 190 is another Cayuga example of the flat pipestone ring, perforated as usual. Fig. 199 is similar, and this form is very common on recent sites.

Fig. 194 is a small pipestone ornament from Munnsville. The sides are curved, and the general appearance not unlike that of a Masonic level. Masonic silver emblems were common among the Indians a little later. Fig. 195, from the same place, is heart-shaped, and dots are disposed parallel with the margin. It is perforated at the lower point. Fig. 198 has the form of some small animal made of pipestone. This is from Cayuga.

Fig. 196 is a stone ring from the Oswego River, and is moderately symmetrical. The work is fair, but coarse. The projection on one side is perforated, and it may have been used for an earring or ornament. Stone finger rings are rare. Fig. 197 is another from Fort Plain, and on the seal are a tomahawk and arrow. These are recent of course.

Fig. 210 is a cylindric pipestone bead from Pompey. This form is rare. Fig. 225 is a curious perforated ornament of stone.

Fig. 226 is a pipestone mask from Wisconsin, which may be compared with New York specimens. Fig. 227 is a small pipestone mask from a recent site in Pompey. Fig. 228 is a rude pipestone mask, nearly square. This is from Munnsville. Fig. 232 is a small pipestone mask from Onondaga Lake. This has a rim above as though part of a pipe, but it is perforated for suspension. It is very finely worked. Fig. 233 is a small pipestone mask which lay on a child's skull in a grave at Scipioville. Another rather rude mask comes from Cayuga County. Fig. 238 is another fine mask from the same county. It is of grey marble, slightly concave behind, and is larger than most good examples here. Fig. 239 is a cobble stone on which is carved a human face. The character is modern and it comes from near Cape Vincent.

Fig. 229 is a quatrefoil of pipestone from Munnsville. It has a circular opening, and is a rare form of ornament.

Fig. 230 is a curious little pipestone ornament with volutes. It is from Munnsville and equally rare. Fig. 231 is a pipestone fish from the same place. Fig. 234 has straight but not parallel sides, and is of pipestone. Besides the grooved lines mostly parallel with the edges, there is inscribed on it the name of 'Joheannes,' in a very neat hand. It was found at Auriesville. Fig. 235 has also straight but not parallel sides. It is of pipestone and from Cayuga. There is a perforation midway in the narrow top, and one near each lower corner. A broad groove runs parallel with three edges, and within this are fine cross lines. It is two and five eighths long by one and five eighths inches wide.

Fig. 237 is also from Cayuga, and of pipestone. The straight sides converge, but the basal line is quite convex. There is a small

superficial perforation at the top and bottom. Fig. 240 is a small pipestone ornament found with a skeleton near Onondaga Lake. There are two perforations. Fig. 242 is a flat oval ornament of common slate, perforated at the small end, and found on an Onondaga site of 1600. Fig. 243 is a small pipestone ornament from Cayuga, with converging sides. It is notched along the edges and perforated. Fig. 244 is similar, but parallel sided, and comes from Pompey. Fig. 245 is a flat serpent form of soft greenish slate, and part of the back has been cracked off. A well defined head and scales remain, as well as the general outline. It is much curved horizontally, is three and seven eighths inches long, and probably very early.

A turtle totem of grey stone came from an early cache in Cayuga. It had projecting head, feet and tail, and was perforated for suspension. A frog of green slate, found in Canajoharie Creek, is well proportioned and carved, but seems recent. A disk of green sandstone from that vicinity has on it a tree, 1774, and W. H. K., and such inscriptions are not rare. A curious hatchet shaped stone found there, has a fine wolf's head in relief. A remarkable ornament is from Belleville, Jefferson County. It has on it what seems a ship, and also a fish with feet. It is of red slate, and much like other recent articles.

With all the vigor of their ornamental work it is commonly easy to distinguish that done by the aborigines from that of the white man, with a moderate experience, and quite as readily may recent work be distinguished from that which is earlier. Little touches make the difference. In some places there are scores of small pebbles adorned with designs, and probably made and used by Indians, but they are almost always recent work. On the great subject of these distinctions we need not enter now, merely calling attention to it.

HAMMER STONES AND MULLERS

Stones with pits or cups are found throughout the world, and much has been written on their uses. Many of them were undoubtedly hammer stones, specially when made of small pebbles, easily used in this way. Even these, however, are not alike, and other

uses have to be imagined. The larger flat stones, with many cavities, are plainly of a different class, but they are not frequent in New York, and require little attention now. They are quite generally considered nut stones, used for cracking hickory nuts specially, and it may be allowed that many had this occasional use at least. North and south alike the Indians made large use of nuts, and there was general rejoicing among the Senecas in 1670, because hickory nuts were so abundant. From these and from sunflowers they procured an oil which they highly prized. That they had suitable implements for cracking or crushing these there can be no doubt. To the wooden pestle and mortar the Mohawks sometimes added the crushing of grain between two stones, and this was more necessary when the harder nut-shell was to be cracked.

That these pits were used as sockets for fire-drills is against all probability. The proper socket for these was the dry wood, which could be set on fire as intended, while the stone could not. That some were used as lap stones is almost certain, and it is perfectly clear that many could not have been hammers. Some may have been used in games, so neatly are they finished, but the subject of their use will not be farther discussed now. The present conclusion is that they had varied uses, some of which are now unknown.

The ordinary hammer stones are too well known to require many illustrations, while, at the same time, there is an almost infinite variety of forms and combinations. A flat polished surface makes a muller; a deeply pitted surface marks many kinds of hammer stones. Those with battered edges probably had this use. Others of soft materials show no traces of this; some approach the southern chungke stone, and may have been used something like that. Hammer stones, so called, are still found on Iroquois sites, but two centuries old, and may have come down to the present century.

Fig. 62 is a circular pebble of brown sandstone, and seems to have been worked into shape. There is an irregular pit in the center on each side, and it never was used as a hammer, being too soft. The diameter is three and three eighths and the thickness one and one half inches. It is from a hamlet on the Seneca River.

Fig. 64 is a double muller. The ends are somewhat convex, as is often the case, and it is finely picked around the very deep edge. This is also from the Seneca River, where many forms abound. It is three and one half inches wide, and two and seven eighths deep. Both these figures are reduced. Fig. 122 is a muller of quite a different character. The last might have been used in a game, but this probably would not have been. It is of greenstone, and has the upper surface picked, polished and rounded, with a depression in the center. The edge is picked, so that it forms a true circle, while the under side is flat and polished. It is four inches wide by two deep.

A fine implement comes from the Seneca River, and is a circular flattened white sandstone pebble, neatly chipped around the edges, and broadly depressed on both sides, this depression nearly reaching the edge. The diameter is four and one half inches. Another is an elliptic pebble of brown sandstone, three and three quarters inches in the long diameter, and about half as thick. It is ground nearly flat on one side, as though for a muller, the remainder being left untouched. This is from Onondaga Lake. Another elliptical sandstone pebble has been roughly ground at one end, as though to change the shape, and an irregular groove has been sharply picked or cut in the center. Many show this primary picking, the depression being made for use, and not by use.

A broad central line of white quartz passes through a handsome angular black pebble, which has been roughly ground at one end, leaving it now a hammer stone, but it may have been intended for the ball of a war club. Many hammer stones have double pits on one or both surfaces of the elliptical or circular pebbles. One from a stockade on the Seneca River is an oval brown sandstone pebble, four and one quarter inches the long way. Sharp and moderately broad cuts have been made in this, in the center, with a sharp tool.

A curious stone comes from an Indian fireplace in East Varick. The Indian soon saw the advantages of compasses, and used them on shell and stone. This brown sandstone pebble has a slight pit in the center, from which six concentric circles were laid out, intersected by a six-pointed star. A recent double muller of grey

quartz, finely polished, is from Indian Hill (1654), and is so neat and symmetrical that it may have been intended for some game. The diameter is two and one eighth inches, and the thickness one and one eighth. It is a beautiful article. One fifty years older comes from a stockade some miles south of this. It is a red sandstone pebble, with both surfaces convexly ground, and with a small indentation. The edges are picked, and it is four inches wide by one and five eighths deep. A combined hammer stone and muller is from Indian Hill, but it has the pit in the center of the flat side. The convex side is depressed, and the edge hammered. A fine nut stone from Rome, nearly six inches across, has three cavities on one side, one of them of a lozenge form.

A curious elliptic pebble of brown sandstone is from Onondaga Lake. It is ground and pitted as usual, and from this a sloping surface has been ground toward each end. One from Cayuga County has terminal grooves instead. On Mohawk sites mullers are also found with European relics.

Fig. 76 is an extremely small muller, but three quarters of an inch across. It is a circular sandstone pebble distinctly ground on one side, and was found on the Seneca River.

PESTLES

Pestles are everywhere found, as might be expected, but were very sparingly used by the Iroquois, who preferred their wooden pestle and mortar, as they do still. The Jesuit missionaries among the Hurons expressed the same preference, although they had a hand mill which the Indians delighted to turn. The primitive implements gave the best results. Mr. Fowke thinks the cylindrical pestle was used as a rolling pin, but has taken no notice of the long flattened pebbles, so frequent in parts of New York. It may be they were sparingly used elsewhere. Stone mortars are more common toward the coast, and the ordinary pestle or pounder must often have been used without them. Prof. G. H. Perkins described a pestle with a carved head in Vermont, and there is one of these in the State Museum at Albany. Mr. Wagman had a fine one of this kind from Lake George, with an animal head at one end. It was 24 inches long and two thick. Several have been seen in the

central part of the State. Mr. Wagman had 23 long pestles, varying from seven to 21 inches long. They are quite as large elsewhere, but vary in form.

There are very many small ones, of long cylindric pebbles, more or less worked, which can hardly have been used in pounding, they are so light. They may have been employed for mixing paint, or for rolling pins. The short truncated forms are rare in New York, nor are the well worked cylinders common. Ruder implements often sufficed.

Fig. 63 is a grey sandstone pebble, seven inches long, and much enlarged at one end. It shows work and use, and was found at Onondaga Lake. This, with those up to Fig. 74 inclusive, are reduced in the illustrations. Fig. 65 is a small angular pestle of sandstone, flat and with parallel sides. It has been picked into shape, and the top is neatly rounded. It is three and three eighths inches long by one wide, and is from Seneca River, where these simple forms abound.

Fig. 67 is a well worked pestle from the vicinity of Rome, much contracted at one end for a little over an inch of the length, and then expanding to a thickness of two and one fourth inches. Hence the edges converge in straight lines toward the smaller rounded end. It is eight and three quarters inches long and angular. Near the broad end is a large pit like that of a hammer stone, which is a frequent feature of these angular pestles, whether broken or perfect.

Fig. 68 is the finest example known of the carved pestles, if it may be classed with them. In the illustration it is more reduced than the others, being drawn half their size. It is 15 inches long, and two and one half broad in the widest part of the handle, if it may be so called, for it seems more of a war club than pestle. It is a long pebble of a hard brown sandstone, and the tapering end, where it was grasped by the hand, shows much use. The sides are flat and neatly rounded at the edges, which are otherwise angular, the implement being about half as thick as wide. The head is boldly but neatly carved, representing an animal's head with conspicuous eyes and teeth. These are not in relief but engraved. Both sides are alike, and the head is somewhat thicker than the

broad handle, from which it is also distinguished at the neck. The eye has two circular perforations, separated by a ring between. A deep cut forms the mouth, and notches on either side of this are the teeth. Although somewhat heavy for a war club it would have been an effective weapon, and the sole signs of use are at the contracted end, farthest from the head. This being so it can hardly be doubted that it was a warlike weapon.

Fig. 69 is a broken sandstone pebble, having a carved head with a mouth and raised eyes or ears. It was found in 1879 at an early site on the Seneca River. One side is flat, and the work is rude. It now measures six and three quarters by one and three quarters inches. A fine example of the carved pestle is in the State Museum, having a fish's head. Several have occurred near the Seneca River which have now disappeared.

Fig. 70 is a fine cylindric pestle from the Seneca River, which has been picked and polished. The greatest width, two and one fourth inches, is just below the center, and it is nine and one half inches long. A larger one, which has lost part of its length, is from the same stream. It is of a long, tapering and cylindric form, polished, but retaining a few pick marks, and is of brown sandstone. It is still $14\frac{1}{4}$ long and one and five eighths inches thick at the small end where it was broken. The thicker end is two and one eighth inches in diameter.

Fig. 71 is very frequent form on the Seneca River, and though it shows use in pounding, it seems to have been oftener employed in grinding, one side and edge being flattened by use. It is a brown sandstone pebble, and was found at Onondaga Lake. The length is eight and three eighths inches, and it is quite slender, the width being one and three quarters, with a thickness of one and one eighth inches.

Fig. 73 is a cylindric and truncated pestle of brown sandstone, which is perfect, and is five and one fourth by two and one fourth inches. Another of similar form is also from the Seneca River, and of a little larger dimensions. Fig. 74 is a truncated pebble, picked at both ends, and comes from the same stream. It is a cylindric sandstone, two and one half inches long by one and three quarters

thick. Dr. Abbott considered these hammers, but hammering and pounding are much alike.

Fig. 75 is a pyriform grey sandstone pestle from Onondaga Lake. It resembles a plummet, but is larger and not grooved. These would not be real distinctions, but while this implement has been picked and polished, the ends have been battered by use. It is four and one eighth by two and one fourth inches.

Fig. 89 is a good example of the small pestles probably used in preparing paint. It is of brown sandstone and quite slender, being four and five eighths by one and three eighths inches. It has slight pits, and is from the Oneida River. There are many like this, but usually larger.

Many large and rude pestles occur. One of brown sandstone, from Elbridge, is slightly spoon-shaped, having a small wedge-like projection at one end, useful for cleaving off bark, and this may have been its purpose. Except this it is rectangular in section, and has the sides nearly parallel. It is 24 inches long, with a general thickness of two and one half inches. Another similar and of the same material, comes from the same town. It is almost square in section, and quite straight like the last. The length is 17 inches, and it is two and one half by two and one quarter inches in thickness. These large and rude implements often occur in various places, and quite a number from Brewerton are full 18 inches long.

A curious but rude pestle of brown sandstone comes from the Seneca River. It is quite angular, and four of the sides are smooth. Between these the edges are roughly chamfered. One smooth side is grooved like a gouge at the smaller end, probably in sharpening tools, and there are pits at the larger end. It is eight and one fourth inches long, the greatest width being one and seven eighths inches. A flat sandstone pestle, from Oneida Creek, has parallel sides and compressed ends, with many pits. The dimensions are six and three eighths by two and five eighths inches.

One from Onondaga Lake has one edge perfectly straight, while the other is picked and curved, and has a transverse groove, perhaps for attaching a handle. Both ends show use. This is seven and seven eighths by two and seven eighths inches. A somewhat

cylindric but six-sided pestle is from Oneida Lake. The size is $19\frac{1}{4}$ by two and one fourth inches. This is a rude article, but a well wrought cylindric pestle, $11\frac{1}{4}$ by two and three eighths inches is from the same place. A flattened one of sandstone, from Oswego Falls, is $14\frac{7}{8}$ by two and one half inches.

A pestle from Oswego Falls resembles Fig. 67. It is square in section and compressed at the larger end, whence it tapers to the smaller. The form is long and slender, being 18 inches in length by two and seven eighths thick. A pyriform pestle of grey sandstone is from Cross Lake, and is ground in lines toward one end. The length is three and one fourth and the thickness one and one half inches.

Though the Iroquois used stone pestles but little, one of the sandstone pebbles utilized as pestles on the Seneca River and elsewhere so freely, has been found on Indian Hill. It is $10\frac{3}{8}$ inches long, perfectly straight most of the way on one side, and showing marks of human use. A cylindrical pestle of sandstone comes from Rome, and is nine inches long by two and one half thick. From the same place is another, compressed near the broad end and with pits on two sides. It tapers as usual, and is flattened. The ends are hammered. It is six inches long by two inches in diameter.

A large pestle with a carved head has been described, found on the Hudson below Albany. The eyes are sunken and the lips lined. The length is 26 and the diameter one and seven eighths inches. One cylindric pestle is from Seneca Lake, and is made of sandstone. It is nine and three quarters inches long and two and five eighths thick.

Quite curious forms occur in Tioga County. A massive squared one from Newark Valley is reported as being 15 inches long and five and one half thick, while other curious ones occur in the neighborhood. One from Owego, broadly shouldered below the handle, is $17\frac{1}{2}$ inches long, six and one half broad at the base and four and one fourth thick. The shoulder is 10 inches above the base, and the weight 21 pounds. A similar one from the same place is 15 inches long and four inches in the greatest diameter. The handle is cylindric, the base being square, and eight inches long.

Fig. 85 is a curious little implement of fine brown sandstone, from the Seneca River. Although so small its form suggests a pestle, but it was probably a paint muller, as it is more adapted for grinding than any other use. It is rectangular both in section and outline, and is one and three eighths inches long, with a long diameter of three quarters of an inch. Both ends are flat, and might be used for grinding.

POTSTONE

Fragments of potstone vessels are found in many parts of the State, but perfect vessels are now very rare. The material was so easily worked that it was used for other things. Naturally the remains of vessels occur oftenest near navigable waters, as they were too heavy to carry far by hand. Among those in the Wagman collection was one with a handle, and such handles are usually more or less carved. The vessels are most neatly finished within, as a rule, and are often quite shallow. Outside, the base is often left rough and angular, perhaps that it may stand the better, or for finishing in leisure hours. The material was not procured in the State, although it occurs here, and probably most of the vessels come from Pennsylvania. Dr. Abbott mentioned none in New Jersey, nor have any been reported in Canada, where steatite pipes are common. Many fragments are perforated, and some have been worked over for new uses.

Fig. 77 is a section of a vessel restored from fragments found at Rome. The pieces were saved, put together, and this is a reduced figure of the vessel, which is 10 inches high and about 20 inches across the handles. The greatest thickness at the bottom is one and one half inches, and this is quite flat, although rounding quickly to the sides. The rim is thin, and this is a common feature. Many vessels are much shallower than this. One from the Oswego River is angular at the bottom, and the total outside depth in places is but two inches, the bottom being three eighths of an inch thick and perfectly flat. The curving rim of this is notched. Another, from the Seneca River, is also shallow, broader at the base than at the top outside, and nearly straight at top and bottom; the bottom diameter being four and three eighths inches. The inner side is nicely curved, and the fragment is perforated in one place. It may be that a better

finish was in prospect for the outside, which is quite rude. The broad handle projects one and one fourth inches, and has five straight grooves on the upper side, at right angles to the vessel. Straight rims, however, are often found.

Fig. 78 is a curious piece of potstone, somewhat like a door knob. It seems complete, and is neatly finished, but has no assignable use. When worked all over, however, steatite might seem finished in any stage. It comes from Onondaga Lake, and is two inches long, one and one half wide, and one deep.

Fig. 79 shows a notched potstone rim, and this form is frequent. Some rims have simply acute notches, while in other fragments they have a rounded form. The perforations are well known. Many fragments are curiously grooved, and one has two grooved edges and two perforations. It is now three and one fourth by two and three fourths inches across.

Fig. 80 is a potstone sinker, made from the curving side of a broken vessel. Grooves encompass it near each end. This is two and three eighths by one and one eighth inches, and one much like it has been found at Owego. The one figured is from the Seneca River.

Fig. 81 is a handsome notched and grooved handle, with part of the notched rim. The projection and width are each one and one half inches. This is a frequent size of handles. Fig. 83 is another broader and heavier handle, being from a heavy vessel found by the Seneca River, and then entire. It was left exposed, broken by frost, and carried off in fragments. If circular it would have been $13\frac{1}{2}$ inches in diameter at the rim. The under side of the handle is smooth, and blackened with use. The upper is adorned with cross grooves. The projection is two and one fourth inches. Several carved handles might be described, and they project from one to three inches or more, with a corresponding width. In the Rome example, the projection is one and one fourth, with a width of two and three fourth inches.

STONE PLUMMETS

A very interesting class of stone implements is that of the plummets, which are somewhat local in New York. They have a very

moderate distribution here, but probably Brewerton, at the foot of Oneida Lake, has furnished more than all the State beside. Even there they mostly occur in a very limited area. They are not rare about Onondaga Lake, and these are the two localities of Central New York. Local specimens differ much from those of the West. It has been surmised that they had a superstitious use, but here they seem confined to good fishing places, and may well be classed as sinkers, although some of them seem hardly fitted for this use.

There are many plummets in the South, having the usual groove but also often perforated. They occur in New England, Ohio, and California. Out of 270 in his collection, Mr. Douglass had but 29 from New York. It would be interesting to know from what points these came. None have been reported from New Jersey. Dr. Abbott says that one was found in a mortar in Massachusetts, and Schoolcraft not only speaks of them in New Hampshire, but says that the Pennacook Indians used them as sinkers. The latter statement may be taken for what it is worth. The Eskimo have similar sinkers, but they are perforated. Among the California Indians it is said they were used as rain charms, and rude ones are found in the Florida shell mounds.

Fig. 3 is a small and slender, as well as rather flat slate plummet or pendant, slightly resembling the older ones. It is rather an ornament than anything else, and comes from a recent site in Pompey. It is placed here because of a likeness which is more apparent than real. The length is two inches.

Fig. 90 is a slender curved one, not of the usual form, but grooved in a frequent way. Near each end is an encircling groove to which a cord might have been attached. Across each rounded end is a connecting groove, often seen at the top of plummets. It is of dark sandstone and was found in Elbridge. The length is four and one half, and the thickness one and one eighth inches. A similar curved one of brown sandstone, from the Seneca River, is much flatter, and has tally notches on each side. This is three and seven eighths inches long, and one and five eighths broad the widest way.

Fig. 91 is a true plummet of fine polished grey sandstone, from Onondaga Lake, beautifully worked and of fine form. The groove

is unusually near the top. It is four and one fourth long by nearly one and one half inches thick. Fig. 92 is of flattened red sandstone, with a pointed eight-sided top above the groove. The body is also angular and rather irregular. This came from the Seneca River, between the lakes mentioned, and is three and five eighths long by one and one half inches wide.

Fig. 93 is of greenstone, generally cylindrical and slightly faceted. The groove is deep and the top simple. This, with several following, came from Brewerton. It is three and one half long by one and one half inches wide. Fig. 94 is very broad, and is polished and somewhat flattened. It is elliptic in section, and made of red granite. It has shoulders but no groove, and is two long by one and three quarters inches broad. A few closely resemble this. Fig. 95 is also shouldered, but without a groove, and is made of hornblendic gneiss. It is two and one half long by one and one eighth inches wide. Fig. 96 is of greenstone, has a square head, and is generally angular, with but slight curves. It is three inches long by one and three eighths wide.

Fig. 133 is of brown sandstone pyriform, and with a deep groove. It is two and five sixteenths inches long by one and three eighths broad. Fig. 134 has no groove, but one has been commenced. It is of quartz and four-sided, but with the angles rounded. It is two and one half inches long and one and one quarter broad. Fig. 216 is reduced in the illustration, and is of a flattened and angular green basalt, one and thirteen sixteenths inches long by one inch thick.

A faceted greenstone, two and three fourths by one and one fourth inches, has a small projection above the groove at the top. A few are very slender. One of polished brown slate from Catskill is of this kind. The outline is a long pointed ellipse. It is three and seven eighths long by seven eighths of an inch in diameter. Not unlike this, but with rounded ends is one of grey sandstone, from Brewerton. It is also less slender, being three and three quarters by one and one eighth inches. Many are ovoid and grooved, but angular forms are common. One of these, from the Onondaga Reservation, is eight-sided, the alternate faces being wide and narrow. It is of light brown sandstone, three by one and

one eighth inches. One of green talc, two and three fourths by one and one half inches, has many facets. This also is from Brewerton.

Angular forms are often thickest in the center. Quite a proportion have a cross groove over the end above the circular notch. A very irregular one of sandstone has about thirty facets, but this is unusual, and such a feature may be only preparatory to a finer finish.

SINEW STONES

Though the name of sinew stones may not exactly express the use of a familiar class of articles, it yet answers a purpose, the grooves being supposed to come from drawing sinews across the stone. The best examples are thus of rather soft sandstone, easily worn. The theory imagines this operation for making an even bow-string, not an unlikely thing. Dr. Abbott described one of these stones, and said they had never been figured before. They are not common, and yet have a wide distribution.

Fig. 86 is unusually fine, having many of these grooves deeply impressed in this brown sandstone pebble, and the other side is like the one shown. This is from Binghamton, and three and seven eighths inches long, which is about the usual size. A larger one from Oneida Lake, has grooves and notches, and is five and one half by two inches. Another, from Cayuga Lake, is almost triangular, and has deep grooves all around. This is three and one half by two and one quarter inches. A brown sandstone pebble from Seneca County, three and one half by two and three quarters inches, has grooves only at one end. These, of course, increase in number and depth through use. One, from Onondaga Lake, has deep grooves, and is three and one half inches long. One of grey sandstone, from Schoharie County, has similar grooves, and is four and one fourth inches in length. A much larger one of grey sandstone, from Oswego Falls, has but slight grooves, being a hard stone. Several come from Brewerton, but this enumeration will show their distribution and leading features. The drawing of thread through beeswax will illustrate their appearance and possible mode of formation. The general form, of course, will be that of the pebble, and the marks will vary with use.

STONE PIPES

Both clay and stone pipes are rare in New Jersey, and these are inferior to those of New York, where so many of the finest examples of both are found. Equally fine are those of Canada, where they are common. At first the Iroquois made clay pipes only, but afterwards used European tools on those of stone. The early and recent pipes are easily distinguished as a rule, but space will not allow a discussion of this, although a few early notes may be given.

In describing the Indians of New England in 1643, Roger Williams said, 'Sometimes they make such great pipes, both of wood and stone, that they are too foot long, with men and beasts carved, so big or massie, that a man may be hurt mortally by one of them, but these commonly come from the Mauguawogs, or the men eaters, three or four hundred miles from us. They have an excellent art to cast their pewter and brasse into very neat and artificial pipes'. These pewter, brass and iron pipes are still sometimes found, but the Mohawks made pipes of clay at the time to which he refers.

In the *Jesuit Relation* of 1653, is the account of a conference between a New England nation and the French. The ambassador 'seats himself in the midst of the place; he takes two great petunoirs, made of a green stone, beautiful and highly polished, a cubit long. This was the fifth present. He fills one of them with tobacco, puts fire to it, and sucks or draws the smoke out of it very gravely. All the assembly watched him, not knowing what he meant. After having well smoked at his ease; "My brother," said he "these two pipes, or these two petunoirs, are yours; it is necessary henceforth that we have but one breath and one respiration, since we now have but one soul"'. These petunoirs may have been stone tubes, pipes sometimes taking this form, as they did in California, nor are straight pipes unknown here.

In his account of the southern Indians, Adair said, 'They make beautiful stone pipes; and the Cheerake the best of any of the Indians, for their mountainous country contains many different sorts and colors of soils proper for such uses. They easily form them with their knives; the pipes being of a very soft quality till they are

smoked in and used to fire, when they become quite hard. They are often a full span long, and the bowls are about half as large again as those of our English pipes. The forepart of each commonly runs out with a sharp peak, two or three fingers broad, and a quarter of an inch thick. On both sides of the bowl they cut several pictures, with a great deal of skill and labor.'

In his early account of the Narragansetts, Wood says, 'From hence other tribes have their great stone pipes, which will hold a quarter of an ounce of tobacco, which they make with steel drills and other instruments; such is their ingenuity and dexterity that they can imitate the English mold so accurately that were it not for matter and color it were hard to distinguish them; they make these of green, and sometimes of black stone.'

Capt. John Smith described the stone pipes, apparently, of the Sasquesahanocks, although they were of the Huron Iroquois family, which then used mainly clay pipes. In describing one of these gigantic men, he spoke of 'his tobacco pipe, three quarters of a yard long, prettily carved with a bird or beare, a deare or some such device at the great end, sufficient to beat out the brains of a man.'

In 1756 Sir William Johnson presented a great calumet to the Six Nations, and said, 'Take this pipe to your great council chamber at Onondaga. Let it hang there in view, and should you be wavering in your minds at any time, take and smoke out of it, and think of my advice given with it, and you will recover and think properly.' Gives the largest pipe in America, made on purpose. They replied, 'We assure you we shall hang it up in our council chamber, and make proper use of it upon all occasions.' This great pipe was used at the conference with Pontiac at Oswego, in July, 1766. Pontiac's pipe was lighted and handed around, and afterwards 'the Onondaga speaker lighted a calumet of peace, which Sir William left in their hands many years ago, for their use, and handed it about to the western Indians.' This probably disappeared in the Revolutionary war.

In his account of the conference between De la Barre and the Onondagas in 1684, La Hontan described the pipe of peace, and perhaps had in mind the one then used. The council assembled,

and he gives a plan of this. 'The Grangula sat on the east side, being placed at the head of his men, with his pipe in his mouth, and the great calumet of peace before him.' Then follows an account of the official pipe. 'The calumet or pipe, is made of certain stones, or of marble, whether red, black or white. The pipe or stalk is four or five feet long; the body of the calumet is eight inches long; and the mouth or head, in which the tobacco is lodged, is three inches in length; its figure approaches that of a hammer. The red calumets are most esteemed. The calumet is trimmed with yellow, white and green feathers.' He gave a small figure, both of the pipe and speaker, but little can be gathered from them. His description is general, and as he afterwards traveled in the West, it may have been made from western pipes. About this time, however, the red pipe-stone came into New York.

Mr. Douglass' collection has 43 New York pipes in a total of 375, but it is evident that they once existed here in great numbers. Besides those made by the Indians large quantities of pipe clay pipes were distributed at councils and treaties by the English, and these antique articles are frequent on the more recent sites. Certain forms of stone pipes are found throughout the Northern States, made within the last two centuries, and those of pipestone are confessedly modern. At present a very simple article suffices for the Indian's need in New York.

Fig. 97 is a remarkable pipe of black soapstone, with inlaid eyes of hollow bone. This fine pipe was found in a grave on the Seneca River, and with it were European articles. The handle beneath is a characteristic of part of the pipes of the historic period, and appears in much simpler forms. When this is found the age may be thus determined in a general way. The bowl is capacious, and the face very fine and expressive. This is turned away from the smoker, another feature of the later pipes, whether of clay or stone. It is four and one half inches high. A head-dress slightly appears, but not such as might have been expected.

Fig. 98 is of yellow sandstone, and was found in Cayuga county. The form of the bowl is both early and recent, and has animals in relief on the sides. It is one and seven eighths inches high. Fig.

99 is a short platform pipe, the bowl being much narrower the other way. Many of these platform pipes are of recent date, the earlier ones often having a curving base. This is from Onondaga Lake, and is one and seven eighths inches long by one and one fourth deep.

Fig. 100 is a black marble pipe from Jamesville, near the site where the Onondaga fort was burned in 1696. The situation, however, does not necessarily indicate its age, nor have we any certain guide to this. All examples of this form have the figure or face, where there is either, toward the smoker, which was an early fashion; otherwise the pipe would seem recent. This has a full length of a man, rudely carved, on the back of the bowl, and the zigzag ornament at the top has a modern look. The lines enclosing the figure, and the raised rim above it, appear in clay pipes made three centuries ago, and this is probably one of the earliest pipes made for or by the Iroquois with metallic tools. The extreme length is four and three fourths inches, about the average size of this form, which frequently occurs. There is, however, an Indian pipe, resembling this form but without the elevated projection and figure, which belonged to Tim Murphy, the noted rifleman and ranger of the Revolution, and which has his initials upon it. It is a little more angular, and is three and one fourth inches long by one and one fourth high. This is not far from the dimensions of some of these. These things suggest a modern date, strengthened by the localities where most of such pipes have been found.

One of these of a burnt sienna color, with a face on the back and a moulding at the top, has the same general character. It is from Baldwinsville, and is two and three quarters inches long. One of soapstone, four inches long, has an elevation like the Jamesville pipe, and is from the Oneida River. Another of the same character, from the Seneca river, is of white marble, and the extreme length is three and three fourths inches. Another with a human figure on the back is from Schodack. It is of yellow soapstone, and is larger than most of this kind. A white one from Root, Montgomery County, has a human figure, and is three and three fourths inches long. Two, with human faces and figures, come from Jefferson

County. Others might be described, and among these, those with two raised heads.

Fig. 101 is of white marble, and has the short stem nearly at a right angle with the bowl. The angles and bowl are rounded, and the latter is chiseled within. This is from Wayne County, and is two and three eighths inches high. Fig. 102 is a stemless pipe bowl of dark soapstone, one and seven eighths inches high. It is curved and polished, and the rim has deep curves between the two raised points. It is a rare form, and comes from the Seneca River.

Fig. 103 is a bird pipe of dark green slate, from the Oneida River. It is moderately thick, and there is a perforated projection in front, to which ornaments may have been attached. It has wings and feathers, a cockscomb, and an engraved collar or necklace, as well as a thick open bill. The form and work are modern. One much like this, but ruder, is in the Canadian collection at Toronto. This has a simpler crest, thicker bill, and less detail than the New York pipe, and is but four and one fourth inches high, while the former is seven and one half inches.

Fig. 104 is a flat turtle pipe of yellowish grey stone from the Oswego River. It is two and one half by two and one fourth inches across, and but seven eighths of an inch high. This form occurs elsewhere, both in New York and Canada, and might be called a platform pipe. Fig. 105 is a very rude and low soapstone platform pipe, from the east end of Oneida Lake. It is one and three quarters by one and one half inches. Fig. 106 is a black marble pipe from the Seneca River. It is perfectly plain, but otherwise much like some already described. From tip to tip it is three and three eighths inches.

Fig. 107 is almost globular, and of grey quartzite. There is a groove around the center, and radiating cuts at the top. The height is two and one quarter inches, and it comes from Van Buren. Fig. 108 is a small black and broken pipe from Canandaigua, much contracted between the low bowl and swollen base. It is not quite one and one half inches high, and is from a recent site. It seems an imitation of some European forms. Fig. 109 is a long platform pipe, perhaps made by the Cherokees. The platform is perforated at the

extreme front, and the bowl is angular. It is five and one eighth inches long and two and one quarter high, and comes from the east end of Oneida Lake. Fig. 110 resembles modern western forms, but is of grey stone. It tapers to a curving point in front, and is three and one half long by two inches high.

Fig. 111 is a double stone pipe, found near Nichols Pond in Madison County, but probably having no relations to it. It is formed like a keg, with a bowl at each end, and stem holes sloping different ways. It is of brown sandstone, two inches high by one and three fourths thick. Fig. 112 is of sienna colored marble, elliptic in longitudinal section, contracted and grooved a third of the way from the top. The base has a projection with a perforation. Height two and one quarter inches. It is a recent form, and comes from Brewerton. A similar one, contracted but not grooved, comes from Cross Lake. It has a large orifice, a basal perforation, and is two and three fourths inches high.

Fig. 113 is a double faced bird pipe, two and one half inches deep, from Monroe County. It is a recent form, with basal fluting and projection. Fig. 114 is a dark stone pipe from Pompey. Like all with this platform and basal projection, it is a recent form. The height is three and one half inches. Fig. 115 is a very different style of platform pipe, from the Seneca River. The extreme length is three and three fourths inches, and the stem hole is at the short end. It is quite thin, and is made of a crystalline stone.

Fig. 116 is from the Seneca Castle of 1779 at Geneva, and is sometimes called the bottle stopper pattern. It has a pointed and perforated base, and is two and three fourths high by one and one fourth inches thick. It is a recent form, of course. Another much like it, comes from the same place. Another is from Canoga, the birth place of Red Jacket, and is a little smaller. Another is from Onondaga Lake, and many more might be mentioned, all with perforated bases, which is a modern feature. It is one of the most frequent and recent of our stone pipes.

Fig. 117 is another bird pipe, similar to Fig. 103, and a rare form. It seems to have been made by the same hand, and was found on the Seneca River. The same style of work appears in some Ohio

pipes, and in one figured by Dr. Rau from New York. This pipe is of green slate, and not thick, and has a perforated projection in front, as well as lines and grooves for feathers. The extreme length is three and three fourths inches.

Fig. 118 is a steatite pipe with a projecting rim on either side of the stem. The same form occurs in clay in Cayuga, where this feature is quite common on clay pipes of various forms. This was found with these, and is a rare form in any material. Except for the flanges it is a tapering cylinder, slightly bent. It is three and three quarters long by one inch in diameter at the top of the bowl.

Fig. 119 is an ovoid pipe from Onondaga, made of grey limestone, and two inches high. The form is rather rare in New York, and may be called a southern form. Fig. 120 is a slender black pipe from Seneca Falls, two and three fourths inches long, and having the stem at a very broad angle with the bowl. Fig. 151 is a straight and somewhat flattened pipe of dark green soapstone. Though others approach this it may be considered unique. It is from Brewerton, and is three inches long, by one and one eighth thick. Fig. 152 is similar but not so straight, and has flanges on each side below the bowl, which is more distinct than in the last. It belongs to the Onondaga Historical Association, and probably is from that county. It is of green sandstone, and is three and three quarters inches long. Such straight pipes are everywhere rare. Another of green soapstone comes from the east shore of Cayuga Lake, and this has a narrow projection on one side below the bowl.

Fig. 153 is a common form in clay, but rare in stone, being often called the trumpet form. It has a curved stem, broadening into the circular bowl, and the latter has moldings and beaded grooves. It is three and five eighths inches long, and was found west of Cross Lake. Its interest is in the material.

Platform pipes sometimes have a slight ornamentation of a simple kind. A fine one from Cross Lake has an oblong bowl at one end, and lines on the top of the platform. The stem hole, as in some other cases, is at the short end of the platform, leaving the longer projection beyond the bowl. The height is one and seven eighths inches. One of brown marble has moldings around the

top, and a zigzag ornament on the narrow edge of the stem. The platform of this comes to a point at the short end. The height is two and one eighth inches. Another of soapstone from the east end of Oneida Lake, has the bowl close to the end of the long platform. It is three and one half long by one and one half inches high. There are many varieties of the platform pipe, and they reach the Hudson at least.

One simple but graceful pipe is from Jefferson County, and bears some resemblance to some before figured, but is more slender. It contracts below the top of the circular bowl, and then gradually expands toward the rounded base. It is less than two inches high. Most of the stone pipes from that county are recent forms, the early inhabitants, probably the ancestors of the Onondagas, having used those of clay. Of these there are fine examples. One curious pipe of mottled green soapstone, comes from that county. The raised end of the bowl, which is at the back as usual in this form, is divided into two broad horns, on each of which is a human face of modern type. It was probably made in the seventeenth century. Each projection is divided into two concentric horns above the face, terminating in a point. In these respects it is unique.

TUBES

Five classes of tubes are enumerated by Mr. Fowke, in the Reports of the Bureau of Ethnology, four of which are represented in New York. To these may be added here those with four flattened sides, which do not essentially differ from the cylindric forms; and those with an expanding end, generally almost closed. The use of all these articles is conjectural, and may not have been always the same. One well supported theory is that they were used in sucking blood when bleeding was resorted to, or in injecting the smoke of medicinal plants. In California they have bone mouth pieces, and are usually classed as pipes. Schoolcraft gave the first account of these in 1843, and those he examined from a Grave Creek mound are like those found in New York and on the east shore of Lake Champlain. His account is not readily accessible, and may therefore be quoted.

'Several polished tubes of stone have been found in one of the lesser mounds, the use of which is not apparent. One of these, now on my table, is 12 inches long, one and one fourth wide at one end, and one and one half at the other. It is made of a compact lead blue steatite, mottled, and has been constructed by boring, in the manner of a gun barrel. This boring is continued to within about three eighths of an inch of the larger end, through which but a small aperture is left. If this small aperture be looked through, objects at a distance are more clearly seen. Whether it had this telescopic use or others, the degree of art evinced in its construction is far from rude. By inserting a wooden rod and valve this tube would be converted into a powerful siphon or syringe.'

For a time these were called telescopic tubes, and it will be observed that the description is like that of those found at Otisco Lake, Palatine Bridge and Lake Champlain, which differ much from the ordinary stone tubes. Those found on the east shore of Lake Champlain, by Prof. George H. Perkins, were from seven to 13 inches long, the perforation being about an inch in general diameter, contracting to half an inch at one end, which had a small perforation, closed by a stone plug. Others have been found on that lake, but these plugs are not elsewhere reported.

The material of tubes in general is soft, and often ornamental. Some are gouged out, and some drilled, and the outline varies greatly. The long ones, with one end expanded, and with a small central perforation in this, connecting it with the usually uniform perforation just within, are of quite soft material. Those from Otisco Lake were either filled or in contact with red paint. This class of tubes embraces those much longer than the ordinary forms, and they are more slender than the long ones of California. Some forms are drilled from both ends, and this may be the case with the larger part. They do not seem to reach the Atlantic coast, but one of oolitic limestone was found at Deming's Point, Dutchess County, which was broken at one end. It is now five and three fourths inches long, an inch in diameter at the perfect end, and one and one eighth at the other.

While it is conceded that the California tubes were pipes, their use in the East is not yet determined. They were made and used by early nations, not the later comers, probably, among whom, how-

ever, bone tubes may have supplied their place. Small bone tubes are found on Iroquois sites, but may have been used for ornaments. Among the Onondagas long tubular bone or cane whistles were employed in medicine making, even within a few years.

Fig. 122 is a tube of dark green striped slate, generally rectangular in section, but with the broader sides somewhat convex and the narrower concave. It comes from the Oswego River, and is of a slightly tapering form. The perforation is usually smaller at one end than the other, and in this case is three eighths by nine sixteenths of an inch. It is three and one half long by one and one fourth inches wide.

Fig. 123 is a cylindric tube of grey striped slate from Camillus, five and five eighths inches long by one inch in diameter. This is the usual form. Fig. 124 is of light olive green slate, a little over three and one fourth inches long, and comes from the town of Van Buren. The orifice is half an inch at one end, and five eighths of an inch in diameter at the other. It is not quite elliptic in section, being flattened on one side. This was found in 1846, and is a rare form. Fig. 125 is a cylindric, tapering tube, of a very beautiful striped green slate, with interrupted bands. It is seven inches long, and was found in Palermo, Oswego County. It is thickest toward one end.

Fig. 128 is a long sandstone tube, apparently, but Mr. S. L. Frey thought it might be steatite on microscopic examination. It is one of several found in graves at Palatine Bridge. The orifice at the small end is over five eighths of an inch wide, and the diameter of the tube there is one inch. The general diameter is about one and one eighth inches, and the length nine and one half, being reduced in the illustration. The perforation is quite uniform until near the broad end, where the outside of the tube suddenly expands, and has a small central perforation in the end. Another is longer. A similar one, belonging to Mr. A. G. Richmond, is 10 inches long, but a little narrower than the one described. It was found in the same cemetery. The graves were quite remarkable, and contained other relics. Fig. 129 is one of a different form, found at the same place, but not in the same grave. The outline is undulating, much like

some wooden handles, and the perforation gradually contracts, showing an important difference in the mode of drilling. The size is four and one half long by one and one fourth inches in diameter. The illustration is reduced.

Fig. 130 is a large and angular tube of soapstone, much curved, and with a raised band in the central part. It is eight and one half inches long, and is from Allegany County. The same form occurs in Tennessee, but is rare.

Three of a greenish white and soft slate were found in a grave by Otisco Lake some years since. They are in fragments, all of which were not saved, and are of the same general character as the first described from Palatine Bridge. The expanded end is one and three eighths inches in diameter, and the general thickness is one and one eighth inches, thus closely corresponding in size. Full accounts of those at Palatine Bridge and Swanton have been published in the *American Naturalist*, and some particulars regarding the Otisco tubes may be of interest. They were unearthed many years ago, in digging foundations for a barn on the east side of Otisco Lake, and were thrown into a soap box with other things, some of which were taken away from time to time. Two skeletons lay side by side with them, well preserved; also arrow points, and lumps of red and white paint. They were about two feet under ground, and the skeletons had their heads to the west. Among the fragments left are two perforated end pieces, and the size of other pieces indicates at least three tubes. Being broken the circular lines of the boring within are plainly seen, and the perforation rapidly contracts near the small hole by a series of four or five circular ridges. Some of the fragments are stained within and without with red paint, but probably did not contain this. The graves were on Mr. Van Benthuyzen's farm north of Amber.

One of reddish grey sandstone, found east of the Seneca River in 1841, and therefore one of the earliest brought to light, was described by the owner as a stone faucet, which it resembles. It is tapering, and thickest near the center. The length is six and one eighth inches, and the diameter one and one half in the thickest part. The orifice is three fourths and five eighths of an inch.

Occasionally one is found unfinished, like a regularly cylindric one from Jefferson County, which is six and three fourths inches long, and not polished. The hole is one and three fourths inches deep, and seems to have been drilled with flint, as it tapers to a point. A cylindric one of striped olive slate is from Onondaga, and is eight and three eighths long by one and one eighth inches thick. Another of green striped slate is from Cayuga County, one side being flat and the rest convex. The orifice is unusually small; not over a quarter of an inch. It is three inches long by one and one half thick. A curved tube comes from Chaumont, and is three and one half long by one and one fourth inches broad. Other tubes have also been found in Jefferson County.

One from Saratoga is three and one half by two and one half inches, an unusual proportion here. A cylindric one of striped slate from Brewerton, is four and three fourths by one and one half inches. A very long one of green striped slate, from near Albany, is 11 inches long, if correctly reported. This would be an unusual size in this material.

Some tubes are very small, and a cylindric one of striped olive slate, from Seneca Lake is two and one half inches by less than one. An unfinished tube from Cross Lake is four by one and five eighths inches. The boring is uniform to the depth of one and five eighths inches, showing circular grooves. It is of picked greenstone.

Out of 73 tubes Mr. Douglass had none from New York.

BAYONET SLATES

For want of a better this term is applied to a small class of rare implements, probably of a ceremonial kind. Very few have been found. They are slender, and nearly or quite parallel sided and triangular in section. One found in Vermont is seven and one eighth by one and one eighth inches, and has no shouldered base. Another has been found in Canada closely resembling this in form and size. Two others come from Onondaga County, and are probably the finest known, as they seem to complete the list.

Fig. 131 is a very fine example of this rare article, and the largest yet found. It is reduced for illustration, but is eight and seven

eighths inches long by seven eighths of an inch wide. The broad surface is flat, the other two forming a ridge at their junction, making the implement triangular in section. There is a slight tapering toward the point, which is formed by a quick curving of the edges. The base is a little contracted, and depressed on the upper side, with slight notches for attaching it to a handle. The material is bluish striped slate, and it was found near Brewerton on the Oneida River.

Fig. 132 is also reduced, and is of a similar article a little wider and much shorter; the length being four and seven eighths inches. The base is shorter and more contracted than the last, and the point not as quickly curved. This is also of striped slate. It was found near Brewerton, and also on low land.

The two just described came from low ground, and are somewhat discolored in this way, specially on one surface. They are as finely polished as other implements of striped slate, and in excellent preservation. No signs of use appear upon them, and they may have had little more than an ornamental character.

AMULETS

Bird and bar amulets are very rare south of Ohio, nor are the latter frequent anywhere. One of the former has been found in Virginia, one in Pennsylvania, and one in New Jersey. The latter one has projecting ears, and is four and one half inches long. They reach Wisconsin on the west, and occur sparingly in New England.

The theories about their use seem fanciful, as some certainly are. Two writers assert that they were worn by married or pregnant women only, and many have accepted this statement. Others think they were worn by conjurers, or fixed on the prows of canoes. It is enough to say that some of the perforations are not adapted to any of these uses. It seems better to class them with the war and prey or hunting gods of the Zunis, some of which they resemble. In that case, the holes, of whatever kind, would have given a firm hold to the thongs which bound the arrows to the amulet, a matter of importance in an irregular figure.

These perforations form the most important feature. The amulet may be but a simple bar, but at each end of the base is a sloping hole, bored from the end and base and meeting. To this necessary feature may be added a simple head or tail, and there may also be projecting ears. None of these are essential. They are but appropriate or tasteful accessories.

Two notable collections contain a large number of amulets. In the Canadian collection at Toronto there are about fifty bird amulets from the province of Ontario, and many of these are much depressed. The longest is six and three eighths inches. Besides these there is a score of bar amulets, a very much rarer form. The longest is six and one quarter inches. They are mostly of striped slate.

The collection of Mr. A. E. Douglass is larger, having 70 bird amulets; 35 of which are from Ohio, and 16 from New York. One of the latter, from near Auburn, has a turtle-shaped head. His collection contains the unusually large number of 38 bar amulets, 22 of which are from Ohio, and but one from New York. The latter seem quite rare here, not more than half a dozen having come before us. Bird amulets are much more frequent, upwards of 50 having been shown us in various places, besides those mentioned above.

They were variable in material as well as form, although most commonly made of striped slate. Perhaps full half have projecting ears, when of the bird form. In the wider forms, usually of harder materials, there are often cross bars on the under side, in which the perforations are made. Occasionally these are not entirely enclosed, yet are without signs of breakage. This seems to prove that these were not intended as a means of attaching them to any larger object, on which they would rest, but rather for fastening articles upon them, as in the Zuni amulets already mentioned, and which were illustrated by Mr. Frank H. Cushing, in the second Report of the Bureau of Ethnology. On comparison a general resemblance to these will be seen, and in a few cases it is quite striking. That they were used in this way, rather than in those suggested by others, is a reasonable conclusion which gains strength with fuller study.

As a class they belong to the St. Lawrence basin and the region of the great lakes, but seem most abundant north and south of Lake Erie. In New York they are most frequent for a few miles south of Lake Ontario, specially near the Seneca River and the larger lakes connected with it. They are found on Lake Champlain also, several coming from the vicinity of Plattsburg. Two came from Washington County, one of which has an expanded body and prominent ears, and is made of slate. Usually this material is confined to the narrower forms. This one is four inches long and one and one half high. The other, of the same material, is of a different form, and shorter and higher. The dimensions are three and one half by two inches.

Fig. 135 is a remarkably fine bird amulet of green striped slate, the longest we have seen from New York, but reduced in the illustration. It is nine and seven eighths inches from tip to tip, and of moderate height and thickness. It was found at Dexter, near the mouth of the Black River, and although in three pieces was not otherwise defaced. The back is sharp, and it has projecting ears and a long neck. The head ends squarely. Another, from the same county, is also large, being eight and five eighths inches long by two high. It has no projecting ears.

Fig. 136 is from Dresden, on Seneca Lake, and is of green striped slate. The ears are unusually small. It is a fine article, and is three and one half long by one and one half inches high. Fig. 137 is of the same material, but is much depressed. The sloping tail expands to three inches in width. This is from Jefferson County, and the length is six and one eighth inches.

Fig. 139 is also of green striped slate, from the Seneca River, and is three and one fourth inches in length. There are no ears, but along the edges are 91 notches. This feature often appears, but not to this extent. Fig. 140 is of trap rock, and comes from Clinton County. It is rude, depressed, and has small ears. The general form is quite straight, but the tail is slightly raised. It is more suggestive of the Zuni amulets than most forms. The dimensions are six and seven eighths long by one and one half inches high.

Fig. 141 is a broad form of mottled stone, three and three eighths long by one and three fourths inches high. It comes from Newark

Valley, Tioga County. There are small projecting ears and the tail comes to a point, as in some others of this general form and material. Two views are given of it. This form is highly polished, and the basal perforations are not always completely enclosed. They have also, as a rule, a slight transverse ridge, in which the perforation is made.

Fig. 142 is from Elbridge, and of green striped slate. It is quite depressed, and the tail is but one inch high, the length being four and one half inches. The large ears have but a small projection, and the general form is narrow. Fig. 143 is from Cayuga County, and is of the same material. It is somewhat depressed, and has a very long and pointed head. The dimensions are five by one and three fourths inches high. Many from that vicinity are depressed.

Fig. 144 comes from near the Seneca River, and is of the same slate. It is three and three eighths long by one and three eighths inches high, and has no ears. Fig. 145 is from Brewerton, where many have been found. It is quite thick and heavy, making a strong contrast with the last. The material is a grey striped slate, and the ears are small. It is five and five eighths inches long.

Fig. 146 is a very curious and fine bird amulet from the Seneca River, four and one half inches long by one and three fourths wide, made of a mottled dark stone, grey and yellow, hard and highly polished. The ears project to an unusual extent, and the forward perforation is not entirely closed. It closely resembles one from Grand Rapids, Michigan, in form and material, but has a more expanded tail. In fact it may be considered the finest example of this class of amulets yet found.

A few others may be briefly described, without illustrations. One of green striped slate, from Baldwinsville, has no ears, and is four and one fourth long by one and three fourths inches high, which is about the average size. The tail varies much in angle and height, in the several specimens, and the head is as variable in form and length.

One of brown striped slate, found a few miles south of the Seneca River, has no ears and is much depressed. It is five inches long and two and one fourth high. Another of brown slate, from Cayuga

County, and which is broken, has a lateral perforation, a frequent feature for a secondary use of ornamental stones, allowing them to be suspended as decorations. The edges are also notched, a frequent feature of amulets, perhaps as a record. The remaining part of this is three inches long. One from the Onondaga Reservation was worn as a decoration by an Indian girl, being suspended by a string passed through the secondary lateral perforation. This amulet is of green slate, and has been broken, having lost the bill or nose. It is still four and one fourth inches long by one and seven eighths high.

A fine one from the Oswego River, of green striped slate, is of unusual form. The ears are elliptic, slightly raised but not stemmed, and there is a shallow groove in each. It is three and one fourth long by one and one fourth inches high. Another, of the same slate, was found south of the Seneca River, and has projecting ears. This is four and one half long by one and one half inches high. Still another, of this material, is from St. Lawrence County, and is one and three fourths inches high by three and one fourth long. It is quite high for its length, and the tail is upright, which is not a rare feature. One of light green slate, from the Seneca River, is quite thin, and had small projecting ears, one of which has disappeared. The tail is low, and the amulet is five inches long by one and three fourths high. Many broken amulets might be described, and some have interesting peculiarities. One of grey slate, from Cayuga County, has a lateral perforation and an unusually long neck. A water worn one, from the beach of Cayuga Lake, has a rounded tail, and a groove across the base.

It will be seen that the bar amulets are few in comparison with the others, but they were apparently all used in the same way. All have the terminal basal perforations, and usually they are slightly raised in the center and at the ends. Fig. 147 represents the typical form. This is of dark green striped slate, and was found on the Seneca River. This is five and seven eighths inches long and three fourths of an inch wide and high. It is slightly elevated and thickened at the center and ends. Of course there is nothing specially

ornamental in this, but it might readily be used as the Zuni amulets were.

Another, almost exactly like this, was found at Onondaga Lake, but is a little longer. Still another of striped slate, very uniform in thickness throughout, was found on the Oneida River in 1879. It had lain for centuries in low land, and was much discolored. The length was five and one fourth inches, and the width and depth one inch each. One from Wayne County is of dark green slate, and has small notches or tally marks along the edges. It has a flattened top, which may have been a curving ridge at first, and is five and one eighth inches long by three quarters of an inch high. A broken one, of the same material, comes from Brewerton, and another, of brownish slate, was found near the Willard Asylum on Seneca Lake. This is four inches long.

BOAT STONES

Mr. Fowke classes the boat stones as a division of the banner stones, sometimes calling them gorgets; neither of which do they much resemble. They are not always perforated, though this may have been the ultimate intention. When this has been done there are usually two holes, bored from the same side. Banner stones have commonly but one hole, which is large, central, and quite uniform. Gorgets may have several, and each one is usually drilled from both sides. The banner stones might have been used on a staff, whether they were or not. No such use could have been made either of boat stone or gorget. Very often, however, fine examples of the former are not perforated, and have little in common with the other implements mentioned.

Few true boat stones, if by this is to be understood those which have been excavated, are to be found in New York. The excavation, however, may be merely a device to make the stone lighter, rather than an essential feature. If this is allowed, as seems reasonable, many might be placed under this head.

Fig. 154 is one of these, four and one eighth inches long, and seven eighths of an inch high. It is a little over an inch in width, and a lateral section gives a long triangle, the deepest part being near one end. Before and behind this are perforations from top

to bottom, of unequal diameter, but each broadest at the base. The material is striped slate, and it was found on the east side of Cayuga Lake.

Fig. 155 has a slightly curved base, with a convex sweep; the upper surface having a much greater convexity. A groove is carried through the base, hollowing it as in the true boat stones. It is of green slate, striped, and has two holes; these, as in other cases, being drilled from the lower side, and are broad on that surface and small above. This was found on the east side of Onondaga Lake, and is three and three fourths inches long, one and one eighth wide, and three fourths of an inch high. The outline of this and the last, from above, is very nearly a parallelogram.

Fig. 156 has a broad broken end, which has been smoothed, and this is perforated somewhat like the amulets; a terminal hole intersecting that bored from base to top. The other end resembles the tails of bird amulets, but is unperforated. Another hole, however, goes from base to ridge, being intersected by a lateral basal groove. Both this groove and the terminal perforation, of course, are secondary. On what was the central apex is a small nipple, frequently found in this class of articles. The perfect end has slight notches, and the material is brown slate. The present length is three and one eighth inches, and it is one and one eighth in height. This interesting example of original design and secondary work is from the Oswego River.

Fig. 157 is of green striped slate, five and one half inches long and one and three eighths high. It was found north of Cross Lake, and has the two customary perforations, one before and one behind the central and prominent nipple. It is a fine example of this form. Some smaller Ohio specimens have quite a pyramidal outline, and the nipple is like a small ball.

Fig. 158 is of the same slate, and somewhat like a low pyramid, but the opposite sides do not quite meet at the top. It is four and one fourth inches long, one and one half wide, and one and one fourth high. This has neither perforation nor excavation, and is from the Seneca River.

Fig. 165 may be simply a long perforated sinker, of light greenish slate, but the terminal perforations suggest both the bar amulets and the perforated boat stones, to neither of which does it belong. There is a slight groove toward one end, and depressions around the holes. The general section would be three-sided. It comes from the Seneca River.

Fig. 214 is unperforated, nor has it a nipple. It expands greatly in the center, where it is over one and one fourth inches wide, while the terminal widths are much less than an inch. It is five and one eighth inches long, and seven eighths of an inch high in the center. The material is brown slate, and it comes from Hannibal. An unfinished one of granite, almost pyramidal and six and one half inches long, is from Oswego Falls. Several come from Cayuga County, and one from Troy has two perforations, and is five and one eighth inches long and one inch high. A fine one of dark olive slate, with nearly straight base and convex upper surface, comes from Canajoharie. There are two perforations from the base, which is also grooved. It is five and one eighth inches long, one and one fourth high, and one and one eighth wide. One of slate, from Tioga County, has a straight base and a rounded upper surface. It is three and one fourth inches long, and has two perforations, the specific number.

True boat stones occur throughout the northern States, and many good examples are found in Ohio. New York has probably as many forms as any. They are found along Lake Champlain, and at several places on the Hudson River, as well as in the localities already mentioned.

CUPS AND MORTARS

Small cups are occasionally found, probably used for holding paint, and usually having one side elevated. Mortars are often but depressions in boulders or rocks, and these are found in all parts of New York, though most frequent near tidal waters. Some of those thus classed, however, are simply hollows made in sharpening tools. Of this character is one on Indian Hill, the Onondaga site of 1654. Several polished depressions will be found in a large boulder there. Mortars, however, were often portable. One from

near Syracuse is of calcareous tufa, seven inches in outside depth, and four and one half inside. The upper diameters are 11 and $11\frac{1}{2}$, with a diameter of eight inches at the bottom. This has been called a mortar, but is properly a vessel of another kind. One from Kendaia is a nearly circular pebble, seven and one half inches across, and excavated on both sides. A fine circular one is from Pompey Center, of limestone, and much like the last. It is nine inches in diameter, and the depression is six inches across. Many of these might be described.

Fig. 159 is a beautiful cup of dark bluish green striped slate, two and three fourths inches across. It was found in Hannibal in 1875, and is unique here, but one has since been added to the Toronto collection, closely resembling this in every way. The form is circular, and the shallow bowl is neatly curved to a point at the base. These two examples add to the other proofs of the close relations of New York and Canada in prehistoric times.

Most cups are of ruder form, and they are rarely symmetrical. Fig. 160 is one of these, and is of soapstone, with one side raised. It is two and five eighths inches across the long diameter, and comes from the Oneida River, with one of similar form. Fig. 163 is a small one found in or near an earthwork in Elbridge, and made of brown sandstone. It is one and one fourth inches wide, and one side is deeper than the other. A paint dish or bowl, four and one fourth inches wide and two deep, comes from the Mohawk River. A small stone ball was in it. There are other examples, but of no special importance.

DOUBLE-EDGED SLATE KNIVES

A class of polished slate knives in New York and part of Canada, has long had the local name of slate arrows, and these are but little known to archæologists in general. They closely resemble but are not generally identical with some of the slate knives of the Point Barrow Eskimo, figured and described in the ninth Report of the Bureau of Ethnology. Those figured in that volume have no barbs, and these are a common but not invariable feature of these New York knives. The grinding and provisions for hafting are identical.

There are suggestive similarities between several Iroquois articles

and those of the Eskimo, but these slate knives were apparently used here long before the Iroquois entered New York. The half circular slate knives of Canada, New York and the Eastern States, also raise the question of early visits of the Eskimo, and the probability of these is strengthened by the recent finding of articles made of walrus tusks, south of Lake Ontario. They occur also in Canada, and near the St. Lawrence. Without discussing this question at length, it may suffice to say that these two forms of knives are in present use among the Eskimo, and that that people lived on the north shores of the Gulf of St. Lawrence 300 years ago, whence, at a still earlier day, it would have been easy for them to make hunting excursions into New York by water. Certain it is that south of New York one of these articles has never been found, and the other but rarely.

In some parts of Canada the knives now to be considered are about as common as in New York, being most abundant on both sides of Lake Ontario. They have not been reported east of Lake Champlain, except in its immediate vicinity, with the exception of one in Maine, nor do they reach more than half way southward to the Pennsylvania line. In fact here they are rarely found far away from the larger lakes and streams tributary to the St. Lawrence.

Fig. 161 is a dark grey slate knife of this kind, and one of a frequent form, being shouldered but having no barbs. There are slight notches on either side of the tang. It is two and three eighths inches long, and not quite one and one fourth wide. Fig. 164 is another of grey slate, two and one fourth long by one and one fourth inches wide. This is broadly shouldered, and approaches the barbed form. The base is of unusual dimensions, being half the length. Both of these are from the Seneca River.

Fig. 166 is very long, and with nearly parallel sides. The base is broken, but it is still five and five eighths inches long by one and one fourth wide. It has barbs and distinct notches, and is reported from Chenango County, an unusual location. Fig. 167 is of grey slate, with long barbs and very deep notches, which are like sharp teeth. It is three and three fourths inches long and one and three

eighths broad. From the Seneca River. Fig. 168 is a small and deeply notched knife, of unusual form, one and five eighths inches long. It is of dark grey slate, and was found at Brewerton. Fig. 169 is of dark slate, and is from the Oneida River. In its present form it closely resembles some of the Eskimo knives, but it probably once had barbs which have been cut away. It is two and one half inches long by one broad. Occasionally one seems to have been broken and recut, leaving it unsymmetrical but strikingly like some recent Eskimo knives.

Fig. 170 is of red slate, shouldered, short and very broad. It is from Jefferson County, and one and five eighths inches long by one and one eighth wide. The notches are deep. Those of red slate are often quite broad. They occur mostly on Lake Champlain, but some are found south of Lake Ontario.

Fig. 171 is of bluish slate, from the Seneca River, and has barbs. It is two and three eighths inches long and one and one fourth wide. This is a frequent form. Fig. 172 is of dark slate, from Chittenango Creek, near Oneida Lake, and is three by one and three eighths inches. Instead of coming to a more or less defined medial ridge, it is sharply beveled from a plane surface to the edges. It is shouldered, and the base has no lateral notches. Fig. 173 is the smallest yet found, and is of grey slate, and one and one fourth inches long by a little over half an inch broad. It is shouldered and rather rude. This was found at Onondaga Lake. Fig. 174 is omitted.

Fig. 175 is of dark slate, somewhat barbed, and conspicuously notched on the edges of the base. It is ground from the center to the edges, like most others, and is three and three fourths inches long by one and three eighths wide. This is from the Seneca River. Fig. 176 is the handsomest yet found, and is from an island in the Oneida River at Brewerton, where broken harpoons, as well as perfect ones, have been abundant. It is of grey slate, shouldered and thin, finely polished, and with an unusually slender base and deep notches. The base is finely finished and rounded. This fine knife is two and seven eighths inches long by one and one eighth wide.

But a few typical specimens are figured, but these knives vary much in proportions and details. The barbs are usually formed by cutting a groove between the cutting edge and tang, and the notches may be simply cuts or half circular grooves. The surface is usually ground all over, and all is polished except the flattened tang, which is often slightly roughened by a coarser grinding. In Eskimo knives this is inserted in a handle, and the New York specimens are usually beveled for this purpose. A few others may be mentioned.

One of greenish slate, from Baldwinsville, is one and three fourths long by one and one fourth inches wide, and is barbed and notched. A similar one is of the same dimensions. A slender one of dark slate is barbed, but has the base broken. It is four and three fourths inches long by one and one half wide. A curious one of red slate is very broad. It is broken, but was originally three and one fourth long by two and one fourth inches broad. It may have been a little longer, but the edges have more than the usual convex sweep. All these are from the same place.

Another broken one, from the same locality, is of dark slate, shouldered, and without lateral notches. The present size is three and one fourth by one and one half inches, and it was once a fine implement. One which is barbed and has a convex edge, is flat in the center, instead of having the usual ridge. It is two and three fourths by one and one half inches. Another fine one of grey slate, also from the Seneca River, has a very sharp point, and is seven and one half by one and one fourth inches, an unusual size.

A small one of grey slate, from the Oswego River, is barbed, and has both blade and base very tapering. It is two inches by one. A long one of grey slate, from Baldwinsville, is also barbed, and is four and one half by one and three eighths inches. A handsome one of brown slate is from the same place, and is shouldered. The surface is rounded and not distinctly ridged. It is three and one eighth inches long by one and one fourth broad.

A shouldered one of black slate, from the Oswego River, is three and one fourth inches long by one and one fourth wide. One from Onondaga Lake is barbed and has the sharp end neatly

rounded, instead of coming to a point. This part differs little from the rest of the work, but if it was the original design it is certainly unique. It was probably repointed at an early or recent day. It is of dark slate, two and one half by one and one fourth inches. One of dark slate, from the Seneca River, has very deep notches, and is one and three fourths long by one and one eighth inches wide. Another of green slate, from the same river, has the same features, and is three by one and three eighths inches. Quite a number of grey slate come from the Oswego River. A fine one of this material, from the Seneca River, is shouldered, but has no grooves or lateral notches. It is three and one eighth inches long by one and one fourth wide, which is about the average size. Another of red slate is from the same place, and is broken, but is two and one eighth inches wide, and was proportionately long; probably about six inches. The base is short and the notches deep. This is barbed.

A barbed one, with a very long stem, comes from Oswego Falls. Another, of dark slate and shouldered, is from Chittenango Creek, and is three by one and five eighths inches. Another long-stemmed knife of grey slate is from Brewerton, and is two and three eighths by one and three eighths inches. The barbs are long and the notches distant. A large black one comes from Cayuga County, and several from Jefferson. These are not far from three inches in length. A large black one is from Rome, where others have been found. A broken one of black slate is from Kendaia, east of Seneca Lake, the extreme southern limit of these articles thus far. The width is one and three eighths and the present length three inches. Several come from that lake, as would be natural from its connection with the Oswego river. A fine barbed one of brown slate, having deep notches, is from Seneca County, and is three and one eighth by one and one fourth inches. Another black and barbed one, which has lost its base, is from the same vicinity. The present size is four and one fourth by one and five eighths inches.

One from near Holland Patent now represents the eastern range of these in the interior of New York. It is barbed, of grey slate and is four and one half by one and five eighths inches. Another of grey slate, from Brewerton, has unusually long and prominent barbs, as

well as deep notches. It is two and three eighths by one and three eighths inches. Another from that vicinity, of black slate, is smooth and thick. It is shouldered but there are suggestions of barbs, and the base is nearly half the length. It is three and one eighth inches long by one and one half wide. In all about 100 have been figured and described in New York, and a smaller number in Canada. Of New York specimens two thirds come from a territory of forty miles square, and always near water. This is significant of their use.

THE WOMAN'S KNIFE

Much better known than the double edged slate knife is the semi-circular one, known as the Ulu, or woman's knife of the Eskimo, and still in use by that people. In the interesting examples figured by Prof. Otis T. Mason and others, will be found those of metal and slate, which closely resemble those of stone found in our fields, shown also with handles attached. Ours, however, are never perforated, nor is the curved outline interrupted before reaching the back, thus answering to but a division of these interesting implements. Dr. Abbott has well said, 'As these semi-lunar knives are more abundant in New England than in the Middle States, and do not appear to have been in use among the southern coast tribes, it is probable that the pattern is derived from the Eskimo, with whom the Northern Algonkins were frequently in contact.' Dr. Rau endorsed this view.

Since these eminent scientists published this opinion many of these implements have been found in New York, perhaps more than in all the New England States, and the features of their distribution point to their use by northern visitors, rather than by settled inhabitants. They are far from rare on both sides of Lake Ontario, but most frequent toward the eastern end, the part most accessible to the Eskimo. Very rarely they have been found in New Jersey and Pennsylvania, and are oftenest near fishing resorts. They were unknown to the Iroquois.

They are all essentially of the same form, the principal difference being in having a simple or a thickened back, so that a very few

figures will fairly illustrate this class of implements, though some others may be described.

Fig. 177 is of a slaty sandstone, and has an unusually deep thickened back, the blade being quite thin. The edge has been broken, and this and the grinding required to keep it sharp, have interfered with the perfect curve. It was found west of Cross Lake, and is two and one fourth inches deep by two and seven eighths wide. These thickened backs are comparatively rare. Fig. 178 is quite unique, being of a black and very hard slate, which is very thick in comparison with others. The ends have been broken, and the back is rounded. It comes from the Seneca River, and its present size is three inches wide by one and one eighth deep.

Fig. 179 has lost about a third of its width which was originally five and one half inches, with a depth of two inches. It is of brown sandstone, with a deep and thick back. This is from the Seneca River. Fig. 180 comes from near Oneida Lake, and has no thickening of the nearly straight back. It is of grey sandstone, and forms nearly a half circle, two and one fourth by six and one eighth inches. A few others may be described.

One from near the Seneca River is of thin red slate, with a simple back, and is nearly a true half circle, being two by five inches. It is quite sharp and symmetrical. Another, from the Oneida River, is also of red slate, two and one half by six inches. One of dark slate, from Camden, has a less convex edge and an irregular back. It is six and one half by two inches. One of red slate, from Oswego County, broken, and now three by five inches, seems to have been originally nine and one fourth by three and one fourth inches. Another, from the same county, and of the same material, has an irregular back, and is six inches wide by one and three quarters deep. A very fine one of red slate, found on the Oneida River, is perfect, and is six and seven eighths by three inches, with a thickness of a quarter of an inch.

Several come from near Lake Champlain. One of these, of mottled slate, is six and one half by two and one eighth inches. A perfect one of dark slate is six by two inches; and another, which has a thick back, is five inches wide by two and three fourths deep.

Many come from near Brewerton and Oneida Lake. One of these is of brown banded slate, and has an irregular back. It is slightly broken, and was originally six by two inches. Another is of brown sandstone, and has a simple back neatly rounded on both edges. It is a little over one and one fourth inches deep, but was originally seven and three eighths wide. One of grey sandstone is five and three fourths by two and one eighth inches. Another of green slate is a true half circle, being five by two and one half inches. It has a straight back, and a similar one has a thickened back. Another, from Oswego County, is made of grey slate and has a straight back. It is six inches wide by two and one eighth deep.

A very light drab slate knife was found a little east of Onondaga Lake, and is five and three eighths by one and one fourth inches. The back is quite irregular. Another, from the Seneca River, is six and one eighth by two and one half inches; and still another of red slate is five and one half by two inches. One from St. Lawrence County has a simple back, which is more convex than usual. It is seven and one half by two inches. A large and handsome one, of purple slate, is from Cayuga Lake, and is six and one fourth by two and one half inches.

Dr. Rau figured a very fine one, in his *Prehistoric Fishing*, from Newark Valley, in Tioga County, which is six and three fourths inches wide, and has a thick curving back. Two others in that work are from Pennsylvania and Massachusetts, and others are added from the Eskimo of Norton Sound in Alaska, one of which is a frequent New York form.

Although most of those mentioned have been found in a few localities, they probably have a much larger distribution, while it is also true that they become rarer as we proceed west and south. In but few instances is the sweep of the blade quite a half circle, and those with thick backs are less symmetrical than those without. Their purpose is evident, from their use by the present Eskimo, being identical with the Ulu or woman's knife. Whether that people actually reached New York will not be debated now, but the opinion of those who think the Northmen found them in New England nine

centuries ago, is certainly strengthened by these relics. At that time the interior of New York had no settled inhabitants, and the New England seaboard does not seem to have been reached by the Algonquins.

BANNER STONES

Dr. Abbott classed certain perforated 'relics as banner stones or ornamental stones, either used in the decoration of weapons or for suspension from the body, after the manner of breastplates.' He adds, 'Whatever may have been the manner of exhibiting such stone ornaments it is impossible to determine, but the fortunate possessor of such a specimen might well be proud of it. May it not be that such stones were the charms of the medicine men? Stones that were concealed from the general gaze of the crowd, and only brought to view with elaborate coverings on great occasions. They do not seem sufficiently abundant to be simply the ornaments of chiefs and warriors'.

All archæologists nearly have conceded that they were not intended for mere use, and an effort has been made to call them ceremonial objects. The good sense of the public is likely to prevail in retaining Dr. Abbott's name. They are peculiar to America, and are of early date although surface finds. They were unknown to the Iroquois, nor has their use been perpetuated by the later Indians; but they are much more abundant than Dr. Abbott supposed.

Mr. Fowke's treatment of banner stones is somewhat confused, but he sensibly retains Dr. Abbott's name, so much more definite than that of ceremonial objects. That they were suspended as ornaments for the body, however, seems in no way probable, while the central perforation gives force to the idea that they were placed on slender poles for badges of authority or use in ceremonies. At the same time they so commonly accompanied the owner on long journeys, that they may have had some superstitious use. They occur mostly east of the Mississippi or in its drainage.

They were not all drilled alike. Some New York specimens, unfinished, show a pointed spiral hole, such as might have been made by a flint drill. Others have a central core remaining, showing

that the drill was hollow. Dr. Rau thought that such an implement might have been made from the southern cane, now used for fishing-rods and pipe-stems, which varies greatly in size, and is hard enough for such a purpose. In any case, sand and water were employed, but the work was slow. The stone was picked into shape, a little polishing done, and this was followed by the drilling and general grinding and polishing.

Of the varieties usually described nearly all occur in New York, though sometimes in a fragmentary condition, and this is true of Canada also. They vary much in form, size and material, but are usually of some ornamental stone, quite frequently the striped slate. Out of 209 banner stones in Mr. Douglass' collection but five are from New York, where they are of frequent occurrence, but rarely on village sites. They are sometimes pick-shaped, like a broad double axe, heart and butterfly shaped, like reels, and sometimes make a double crescent with four points.

Fig. 184 is of light green slate, slightly banded, and is of an expanded double hatchet form, which might be called that of a butterfly. It was found not far from Three River Point. As in most of the others, the orifice is a little larger at one end than the other, and the average in this one is five eighths of an inch. The extreme width is four and three eighths inches, and it is two and three fourths deep.

Fig. 185 is a straight, pointed, and elliptical article of green striped slate from the Oneida River. It is here represented in profile, which is the narrow way, an unusual feature, and thus the perforation is made through the narrower central diameter. It is four inches long, one and one eighth wide, and three fourths of an inch deep. The material is fine. Fig. 186 is very different, generally circular, but a little angular. It is of green striped slate, and one side has been broken. The depth is four and one half, and the original width five and three eighths inches. A deep rectangular indentation meets the orifice above and below, thus shortening it; and it has the usual central expansion of the thinner forms. It comes from Onondaga Lake.

Fig. 187 is nearly elliptical, but the wings terminate in points. It has one deep indentation, like the last. It is of thin striped slate, thickened in the middle as usual, and the dimensions are five and one half in width by two and five eighths inches deep. This was found four feet below the surface by the outlet of Chautauqua Lake, above Jamestown.

Fig. 188 is also of striped slate, with an orifice averaging five eighths of an inch. It came from Camillus, and is of the butterfly form, but differs from most specimens in not having the wings in a plane. It is rather thick, and is four and five eighths wide by one and seven eighths inches deep. Those as heavy as this of course might have served some useful purpose, but they are not sharpened and show no marks of use. The perforation is larger than would be required for mere suspension, and it seems reasonable that a handle or staff was inserted in this. The difference in the terminal diameters of the orifice is usually an eighth of an inch.

Fig. 189 approaches a long heart shape, indented at each end, and with the customary central ridge. It is of olive green slate, and much narrower for its depth than usual, though many have this general form. The larger diameter of the orifice is seven sixteenths of an inch, and the stone is two and three fourths wide by four and one eighth inches deep. This and the next are from Brewerton. Fig. 191 is quite curious from its unsymmetrical form and unusual perforation, the latter being elliptical. The material is a beautiful green striped slate, showing a fault in the stone, a not infrequent feature. This is quite sharp near the perforated end, and the outline each way is not unlike some forms of broad celts. The greatest diameter is two and five eighths inches, and that of the orifice eleven sixteenths of an inch. Of course the latter was not made in the usual way, although neatly finished. This beautiful and remarkable article was found not very long since.

Fig. 192 is unfinished, and those in this condition are hardly rare, but this has unusual interest from showing the mode of drilling, as well as preliminary work. It is of a hard greenish and crystalline stone, picked all over into a symmetrical form, and ground above and below. On the lower edge the work of perforation was begun

with a tubular drill, and this was interrupted when a depth of but an eighth of an inch had been reached, leaving a core in the center. The implement is thick and heavy, somewhat hatchet-shaped, the blades being about equal on either side, and it is six and three eighths wide by two inches deep. This is from the Seneca River, and not from a village site, in which it agrees with some other specimens.

Fig. 193 is one of the frequent reel shaped articles, and is nearly perfect. The material is olive brown striped slate, three and five eighths wide by two inches deep. The orifice is half an inch wide. This form expands gradually to the center, and the terminal indentations are beveled to a moderately sharp edge. Quite often the upper and lower edges are grooved throughout, but this one has a plain surface. It comes from Lysander.

Fig. 200 is one of the most beautiful of these articles, and comes from Fabius or Pompey, much resembling one in the State Museum from that vicinity. It is made of a beautiful olive green striped slate, and in form is like a slender pickaxe, having a central ridge along both sides, from end to end. Each end has a slight projection. In the center, on one side, is a partially effaced ornament. It is seven inches wide by one and one fourth deep, and the orifice is nine sixteenths of an inch in diameter. No finer example of this form is on record.

Fig. 201 is a pick-shaped article of black slate, unique in some respects. The center is enlarged by a distinct concave sweep on either side, terminating in a central flattened surface. Near this is a lateral perforation on either hand, drilled precisely as in the gorgets. No other has been reported with holes like these, and if the stone had been placed on a staff, they might have served to attach pendent ornaments. The sides are covered with transverse lines, suggesting tallies. The blades are thin, and the total length is six inches, with a depth of one and one fourth inches. It was found on a camp site on the Seneca River in 1875. The ends are abrupt, and may be either broken or unfinished.

Fig. 202 is a thick, crescent formed banner stone from Skaneateles Lake, made of green striped slate, and one inch deep by three and three

eighths wide. The ends are rounded, and the orifice is a little over half an inch in diameter, contracting slightly in the interior of the stone. There are no village sites near, and but few small camps. Fig. 203 is elliptical every way, but roundly pointed at each end. It comes from Dresden, on Seneca Lake, and there is a fault in the green striped slate of which it is made. It is three and three eighths wide, and one and one half inches deep.

Fig. 204 is a straight pick form, *a* being the profile, and *b* the basal view. The base is longitudinally grooved, and the gradual expansion makes a central ridge unnecessary. It is of light olive green slate, having a depth of three quarters of an inch, and a width of three inches. The orifice is three quarters of an inch. This is from Oneida Lake.

Fig. 205 is another unusual form of light green striped slate, with an elliptical perforation, as in Fig. 191, but not so narrow. Both ends are grooved, and the lateral edges are almost sharp. It is two and one half inches wide and one and one half deep. The thickness is three quarters of an inch. A banner stone of bluish drab slate, from the Seneca River, is a little broken, and approaches the heart shape. The perforation is half an inch in diameter, but enlarges within, an unusual feature. This article is three and three fourths inches deep and three and one half wide. Another, of similar shape and found some miles from the same river, is two and one half inches deep and two and one eighth wide. This is made of an olive and mottled slate, the perforation in which averages over half an inch wide. Another of olive slate found near the last, has straighter and nearly parallel sides. There is the usual expansion in the center, and it is nearly three inches deep by two and one quarter wide. The perforation is about half an inch. Still another approaching the heart shape is from the head of Oneida Lake, on the north side. It is of bluish olive slate, three and one quarter deep and two and three quarters inches wide, and thickened in the center. There are lines across the edges. The orifice is over half an inch, and drilling coarse. Another of similar form comes from the west end of the same lake, and is of a dark mottled slate, three inches deep and three and one fourth wide. As a rule the perforation

varies but little from half an inch. Another, of a double hatchet form, is from the east end of the same lake, and is made of a porous bluish white stone, slightly banded. There are notches on one edge, and the orifice is finely drilled, being smallest midway.

A handsome fragment is from Onondaga Lake, where it was found in 1877. The material is bluish striped slate, very smooth and thin. The broken edge, which was along the perforation or nearly so, has been smoothed, and a small hole drilled in the upper corner, placed there for its later suspension. It might be called the butterfly pattern, and the original size was six inches in width and three and one half in depth. The thin wings continue very uniform in diameter till the central ridge is reached. Another, of similar form, but thicker, and made of purple and green slate, is from the same lake, and is finely drilled. It was originally five inches wide and two and one quarter deep.

One of these, made of polished greenstone, is from the Seneca River, and is two and one eighth long by one and five eighths inches wide. The orifice, however, is so small as to make it doubtful whether it may not originally have been the stem of a large platform pipe, recut for an ornament after being broken. It seems best adapted for such a purpose. Many of the heart shaped forms might be described.

An unfinished one, much like Fig. 192, is from the Seneca River, and a little broken; it is of greenstone and angular and thick, being about six and one half inches long and one and three eighths deep. A similar one, unfinished and picked all over, is from the same river, together with the next two. It is large and thick. One of the others is nicely picked and ready for grinding, except in being unperforated. It is of greenish grey sandstone, and the oblique wings are brought nearly to an edge. It is conspicuously thickened in the center, and the wings are at an angle suggesting those of a windmill. It was found in 1883, and is six and three fourths by two and one half inches. The other is of the same general form, but deeply indented above and below, and is of light brown sandstone, picked and partly ground. It is eight and one fourth inches wide. All these unfinished banner stones have a

general resemblance and were found within a distance of a few miles. In the last drilling was commenced with a sharp point.

A finished half circular banner stone from Cazenovia, of olive slate, has one wing broader than the other, and is three and three fourths inches broad by two and one fourth deep. Another half circular one of dark grey slate, thick and unpolished, is from the Seneca River, and is four and one half inches wide by two deep. A reel-shaped one, from the same river, is grooved above and below, and one side is deeper than the other. It is of dark green striped slate, three and one fourth wide by one and three fourths inches deep. The orifice is of the usual size.

Perfect banner stones of pick and crescent forms have been found near Cayuga, Canandaigua and Seneca lakes, and in Jefferson County. They are rare along the Mohawk, though sometimes found there. A large unfinished one is from Seneca Lake, and is seven and three fourths wide. A still larger unfinished one is from Baldwinsville, and is nine and three fourths inches wide, with quite oblique wings.

One only of the double crescent form, with four horns, has been reported, and that is broken. It is of green striped slate, and was originally six by five and one fourth inches. It is from Oswego County. This rare and beautiful form is also found in Canada and Ohio. A pick or hatchet form, quite angular, comes from Sullivan County, and is of variegated soapstone, thin and polished. It is five and three eighths inches wide.

Several banner stones are from the vicinity of Owego, in Tioga County, and a fine unfinished one has lately been described, recently found in Ellington, Chautauqua County. It shows a core where drilling was commenced, but is nearly half circular in form, instead of that of those already described. A curious article, suggestive of banner stones, is from Brewerton, where several have been found, made of brown sandstone. They are nearly circular, flat and notched, and with a rough ridge left in the center, from one indentation to the other. The diameter is four inches, and they are unique. The abundance of banner stones may be inferred from the selected examples given.

GORGETS

Gorgetts are found in Europe, but they are different from those in America, where there has been much speculation as to their use. There is no direct evidence that they were twine twistors, as Schoolcraft thought. The Iroquois required no artificial means in making thread, and knew nothing of these implements. Perhaps as little can be said of their use as guards against the recoil of the bow string, for which some of them certainly would have been a clumsy contrivance. Dr. Abbott's conclusion is very much better, in supposing they were ornaments variously used. They are usually symmetrical, and drilled from both sides, each perforation terminating in a smaller hole in the middle. Occasionally they are left unfinished, and often seem merely ornaments. In that case it is probable they were not so much suspended as fastened to the wearer's dress by one or more holes, like some shell gorgets; or the superfluous holes might have been for the attachment of other light ornaments to them. However this was, they certainly had no rough usage, but may well have been worn like the frontal crown and the breastplate of the Hebrew high priest.

If they were ornaments, many may have had a more practical use. A few have a chisel or a gouge-like edge. They are of very wide distribution, and perhaps are as abundant in New York as anywhere, presenting many beautiful, and sometimes rare forms. This is not generally known, because of lack of publication. Mr. Douglass has 360 in his collection, and but 20 of these are from New York, their supposed abundance or rarity depending on the collector's field or tastes. They extend across the continent.

Dr. Abbott observes that they are found near the breast in New Jersey graves, and this holds good in New York, where, however, but few occur in tombs. He found most New Jersey specimens of one form. In New York there seem no bounds to the varieties. One was taken from a grave at Deming's Point in Dutchess County, which was of dark striped slate. It had one hole and 41 tally marks. The dimensions were four and one half by two and one fourth inches. Another, with but one hole, was taken from a burial mound

at Onondaga Lake, and others are from the extreme end of Long Island.

It will be found that those of stone did not essentially differ from the shell gorgets, worn by the Iroquois in colonial days, which usually have ornamental designs and two perforations for suspension. The well known buckle of the silver brooch, still in use, shows that the Indian had a good idea of the advantage of two points of contact. With good tools the flat ornaments of shell and stone usually had two longitudinal perforations, insuring the best modes of attachment or suspension. There seems abundant testimony, historical and otherwise, that the American stone gorget was an ornament, but it is not necessary to produce all this here.

Fig. 206 has two long parallel sides, and is made from a banded yellowish olive quartzite, which is almost a sandstone. It has three holes, and another has been commenced on one side. One end is gouge-like, and the dimensions are four and five eighths by one and one half inches. It is from the Seneca River. Fig. 207, from Monroe County is very different. The base line is one and three quarters inches long, and from this the sides rise three and one fourth inches with a concave sweep. The width is then two and three eighths inches, and above this the top lines converge to a point, making the extreme length four and one eighth inches. It is of brown striped slate, and has but one hole.

Fig. 208 is one of green ribbon stone, or striped slate, much like the last but with the tip broken. It has but one hole, and the extreme length now is four and one eighth inches. This is from the Oswego River. Fig. 209 is a beautiful gorget of green striped slate from Oneida Lake. It has two holes, tapering sides, and expanded and somewhat rounded ends projecting beyond these, rather abruptly leaving the sides. The length is three and five eighths and the breadth two and one eighth inches.

Fig. 211 is a remarkable gorget of dark olive slate, found in a small mound in Jefferson County, and which could have been used only as a breastplate. It has two small holes, and the sides are generally parallel. Two of them, however, expand near the base, which becomes nearly six and one half inches wide. The general

width is four and three fourths and the height six and three eighths inches. It is not thick. Another, found with it, differs slightly from it in size and form. The height is the same, but the base becomes seven and one fourth inches wide. This is of black slate. There is a ruder and smaller one in the Toronto collection, from West Ontario, which has but one hole. It is five and three eighths inches high by five and one eighth in extreme width. These are all that have been reported of this form. The figure here given is reduced.

Fig. 212 is a more frequent form with slightly convex edges, coming to a point at each end. In this article these points have been broken off, the original length being six and one half inches. The width is one and three eighths inches, and it has two holes. The material is bluish grey slate, and it comes from the Seneca River. Fig. 213 is a gorget found a few miles from the last, and is nearly triangular. The material is a banded red slate, and there is but one hole. It is five and three fourths inches long, two and three quarters at the broad end; the narrow end three quarters of an inch wide. Both these are reduced in the illustration.

Fig. 217 is a rare form, the upper and lower edges being curved and parallel, with the upper line longest. The ends are straight, but not parallel, and there are three holes near the center. It is of grey striped slate, and was found near the Oneida River. Fig. 218 has curving sides which do not reach a point at the ends. It is of brown slate, and the edges are moderately convex. It has two holes, and the length is five and one half with a width of two inches. It was found west of Onondaga Lake. Fig. 223 is of similar but broader form, and has two holes, perforated mainly from one side. The stone is striped with cream color and purple, and is of handsome material. It was found near Beaver Lake, Lysander, and is six inches long by one and three quarters wide. Fig. 224 is a curious gorget found in the western part of Onondaga County. The base and top are slightly convex, and the lateral edges are concave. Two of the angles are rounded. It has two holes, and is sharp. The length is four and one half and the extreme width two inches. The material is striped slate.

A very pretty elliptical gorget of dark green striped slate is from the Oneida River, and has two holes. It is two and seven eighths by one and one fourth inches. A very large and thin one from the same river, has two small holes. It is of green striped slate, and nearly rectangular. The dimensions are seven and one fourth by three and three fourths inches. One of polished sandstone, but with a sharp convex edge is from Black Creek, near Oneida Lake. The form approaches the triangular, and it is seven inches long by three and three eighths wide. There is but one hole. This seems more like an implement than most, but sharp edges are not uncommon.

Those with notches, also, are not rare. One of black slate, from Lake Champlain, has notched ends and but one hole. It is seven inches long by one and seven eighths wide. Others might be described from Chautauqua County, with this feature, as well as from other places. In fact they were so striking a part of personal decoration in early days, that they may be said to occur everywhere.

GROOVED AXES

Grooved axes are extremely rare in most parts of Vermont, New York and Canada, though not altogether unknown. Out of 419 in Mr. Douglass' collection but two were from New York, and Dr. Rau figured none. Mr. Gerard Fowke said, 'In the eastern and interior States the grooved axes are far more abundant than the celts of the same size, because, as a rule, only the larger implements of this class are grooved. All the ordinary varieties of axes and hatchets are found about Lake Champlain, by far the most abundant being celts or grooveless axes.' Between there and Lake Erie a grooved axe is a rare find indeed. In the later days they were not in use among the Iroquois as far as appears, and it may be questioned whether some occasionally found in New York, may not in some instances have been lost by collectors.

In his history of Onondaga, Mr. J. V. H. Clark represented that hundreds of these, particularly described, had been found on an Elbridge site, but farther inquiry proved this an unaccountable mistake. They sometimes occur, but are evidently foreign to the soil.

Fig. 215 is a narrow form, of light greenish stone with a groove all around. This is reduced in the figure and is from Jefferson County. Some occur of the more typical forms, specially in the southwestern part of the State. They are said to be more numerous east of the Mississippi than west, but this may be due to the number of collectors. The southern Indians have used them in historic times. The single grooves were for attaching the handles, and sometimes there are double grooves. They have been used by the Pueblo Indians.

While so rare in New York, Dr. Abbott reported many from New Jersey, and from every part. One axe weighed nearly 14 pounds, and several large caches of these implements have been found there. One contained 120 axes. Among three from Tioga County, N. Y., was one of eight pounds. There were none in the Wagman collection at Saratoga.

Celts and gouges are sometimes roughened or grooved for securing the handle, and a few broad axes rather suggest than have the groove. Fig. 219 is a flat axe of brown sandstone, not grooved across the surface, but with a deep and broad notch in each lateral edge. It is a rare form, altogether unlike the typical implement.

POLISHED PERFORATORS

Fig. 221 is a neat polished perforator of brown sandstone, from Madison County. It is two and three eighths inches long, and much like some bone perforators in general appearance. Those like this are rare, for the early comers used flint, and the Iroquois very much preferred horn and bone, yet these seem to have belonged to them.

Fig. 222 is from the same place, and is notched and more angular. The broadest part is near the point. This is two and three fourths inches long. Another of black basalt, with an oblique central notch, comes from the Nichols Pond site, the Oneida town of 1615. It is three and one eighth long by five eighths of an inch thick. This is decisive of its Iroquois use, but such a splinter of stone might be ground as easily as bone, the general form being the same.

GROOVED BOULDERS

In the Onondaga and Seneca territory specially, are found large boulders with straight grooves, from one to seven in number, and

very uniform in depth and width. Occasionally small stones are grooved in the same way. Fig. 241 is a reduction of one of these from the Minden earthwork, south of Fort Plain. It is a block of sandstone, 15 by 18 inches across, and has two grooves of the usual width and character.

Another of these, but much smaller, comes from Schoharie, and is five and three fourths by three and three fourths inches. This has three parallel and one cross groove, but they are reported much narrower than usual, being but little over a quarter of an inch wide. The block is of grey sandstone. Another small one comes from Frenchman's Island, in Oneida Lake. In this the groove is three quarters of an inch wide, with another partly within it. A few other small ones have been found, but usually large boulders were used. Of these larger ones Dr. Rau mentioned some in Massachusetts and New York.

One of clay slate and of irregular form comes from Dutchess County, and is 17 by 13 inches, and seven inches thick. It has one perfect groove, now 10 inches long, but originally more. This is half an inch wide and three eighths deep. Another groove is unfinished. One from Deming's Point is broken through the center of the second groove. This is now 10 inches long, but originally more. The width is five eighths and depth three eighths of an inch. Striæ appear in both.

The most remarkable of the large grooved boulders, is that described by Clark in his history of Onondaga, and it was the first to attract much attention. The Gothic letters XIII fairly represent the arrangement of the grooves. The boulder is of corniferous limestone, $23\frac{1}{2}$ by 22 inches across. The grooves are wider than usual, being three quarters of an inch, and the striæ are obscure. The longest groove is about 15 inches. It was in the ravine by the old Indian Fort in Pompey, reputedly of recent occupation. Another from that vicinity is also of limestone, 26 by 22 inches across. There are seven grooves irregularly dispersed, five eighths wide and three eighths of an inch deep. The grooves are about seven to 12 inches in length. A small block of blue limestone, much weathered, has two grooves. Another in the same condition, has

five grooves, and the block is 16 by 18 inches. One of these grooves intersects the rest. They are five eighths wide, and three eighths of an inch deep. One of red sandstone, 15 by 18 inches, has one groove, 14 inches long, and of the usual width and depth. Some of these Pompey stones came from historic sites, and were undoubtedly used within the last three centuries.

A fine one of sandstone, from Yates County, has three grooves about 20 inches long and of the usual width and depth. Another has five grooves, and still others have been found there. Two were found in Hector, Tompkins County. One is of slate, 10 by 10, and about three and one half inches thick. It has five grooves across the face, which are nearly parallel. Four of these are but little over half an inch apart, and are half an inch wide and a quarter deep. The fifth is a little wider. The other stone is also of slate, eight and one half by 12 inches, and three and one fourth thick. It has two grooves, and all these are striated like the rest.

Two more in Pompey are on either side of a stream, and partly imbedded in the banks. The exposed part of one is 24 by 30 inches, and the ends of the five grooves are buried in the earth. They are nine, 16, 14, 11, and eight and one half inches long. The boulder is common limestone. The other is in the west bank of the stream, and is of corniferous limestone, partly exposed. Both boulders extend into the brook. The exposed part of this is 24 by 30 inches, and has two grooves, which are nine and 10 inches long. The grooves and striæ are carried through the flint nodules as in the others, a feature best seen when the stone is wet.

The use of these stones is of interest, and nothing has been suggested but that of straightening and smoothing arrow shafts, by rubbing them in these grooves. There are objections to this, but they may not be insuperable. In the case last mentioned, the pointing of the grooves against a steep bank would embarrass arrow making, the most convenient position being parallel with the stream. If the shaft were long the difficulties would be increased. That water and sand were used may be inferred from the parallel striæ, and the usual position near a stream. That the grooves were made with a purpose directly connected with their size, may be inferred

from the uniformity of that size, and the absence of narrower and shallower grooves. As to the period, they may have been in use in Onondaga County and vicinity for a hundred years after the forming of the Iroquois League, but probably less.

The Indians of the present day have simple methods of arrow making, and whether their fathers made these grooves with so much labor, for this purpose, may be a question still. The strong point is that there is no other apparent use for them.

Grooves of another kind are not rare, and among these are the sharper cuts made by sharpening tools on boulders. A large stone was often very convenient for this purpose, and some may still be seen on old village sites. As the Indians learned to melt and cast metals, they sometimes made use of a small stone for a matrix, and such stones are occasionally found. So are whetstones, easily recognizable by their marks of use. They are commonly slender and small.

After the foregoing was written, Mr. A. G. Richmond described a large grooved boulder, weighing 1970 pounds. Of this he says, 'There are three grooves at one end, pretty well off on the slope. Three more toward the center, and a seventh one started in the center.' He thinks they were certainly used in working arrow shafts, and while there are certain difficulties in the position of those found in place, he makes suggestions worthy of consideration. These are quoted here, 'My theory is, and it would answer on every stone I have seen, that they sat astride, and worked the arrow in front of them, as my observation is that they all have grooves across, rather than lengthwise of the stone. Another thing makes me think they were made for this purpose, and that is that when the groove reaches a width sufficient for the maximum size of arrow shafts, they proceed to make a second groove. If it was for some purpose that did not require a uniform or absolute size, one groove would answer every purpose.'

The crosswise grooving, however, while general is not invariable. The uniformity of the grooves, of which he speaks, is one of the remarkable features of these curious stones.

MISCELLANEOUS

Fig. 220 is an elliptical brown sandstone pebble, two and one sixteenth inches long by seven eighths of an inch wide, and having a central groove and notched ends. It may have been a sinker. Fig. 236 is a perforated ball from Elbridge, found near an earth-work. It is a soft brown sandstone, one and seven eighths wide by one and three eighths inches deep. The top and the bottom are unequally flattened, and the diameter of the opening is less than an inch. A curved yellow stone, much like a horn in outline, is perforated at the broad base. It comes from the Oswego River.

Many years ago a fine carving made from the black slate of the northwest coast, and in that style, was found in Tioga County, but whether it was brought by an Indian or lost by a white man, may be a question. It is a characteristic piece, and of its ultimate origin there can be no doubt. A Sandwich Island adze was found in Marcellus some years since, but the cause for this seems clearer. It was brought there by a recent traveler, was lost and found again. Similar instances might be cited of unexpected articles found even in Indian hearths and graves.

Mr. Fowke considered stone cones rare in the South and West, and they are still rarer in New York. A true stone cone, however, comes from Jefferson County, and is two inches high. They have been reported nowhere else, but small pyramids occur. A pebble, flattened like a muller, has a groove lengthwise from the flat surface at each end. It is four inches long, and comes from Cayuga County, where other odd forms are found. An oval pebble, with perforations representing eyes, has its edges chipped. This is from Brewerton, but similar things occur elsewhere, being usually recent forms. Many puzzling pieces are probably unfinished, and of the intention of others we know very little. Some doubtful forms have been passed over, there being no present occasion to discuss their authenticity, while others of undoubted value have been regretfully left unnoticed.

Plates, blocks and ornaments of mica have been found in Cayuga, Cattaraugus, Chautauqua, Chenango, Monroe, Oswego, Suffolk, and perhaps other counties. They are quite rare.

While the Iroquois made many records by pictures, these were usually on wood or bark, but sometimes were painted on stone. Such examples were known in St. Lawrence and Montgomery counties. No engraved pictures in rocks have been reported here, but a few occur in large stones, notably on the Hudson. There is an account of footmarks in stone in Suffolk and Westchester counties, and in the latter mortars are common, excavated in the rocks.

Stone heaps occur sparingly all over New York, and there are frequent allusions to the aboriginal custom of casting stones on such heaps, in early records. The stone heap near Schoharie creek was the most noted of such monuments, and was constantly added to as late as 1753, if not later. Such heaps sometimes covered graves, but not invariably. The Schoharie tumulus was reported as four rods long, between one and two wide, and from ten to fifteen feet high, being of the largest size. An early account of it will be found in the *New York Documentary History*. Small heaps of stone are sometimes found within the lines of forts, gathered as defensive missiles, but they are not conspicuous.

This bulletin completes a general view of the stone implements and ornaments of the aborigines of New York, to which the paper on articles of chipped stone formed the introduction. Abundant materials are in hand for others on the interesting earthenware of our early inhabitants, as well as their articles of bone, horn, shell, wood and metal, of scarcely less interest and beauty, should it be determined to complete such a series. Any information on either rare or common articles of this kind will be gratefully received. Figures are desirable, with full descriptions available for record, but specially notes of locality. This most important point in comparative study should never be neglected. Of course contributions to the State Museum are very desirable, and many collectors may be disposed to do a public service in this way, but clear and full notes, to be compiled and preserved, will be an acquisition of no

small value. Maps of localities, with descriptions of sites and finds, will be no less prized, specially from places where little has yet been done. These preliminary bulletins will reach many, it is hoped, who will take an active interest in the matter. There are many good private collections of aboriginal articles, and a simple systematic description of the New York relics in these would be a great aid in scientific research. It is a work in which many might and should share, and the prospective results are great indeed.

EXPLANATION OF PLATES

Many figures are greatly reduced for lack of space, and for convenience in arrangement some small ornaments are not placed in consecutive order. For full descriptions given in bulletin, see index under *Plates*.

FIG.	NAME	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	DEPTH OR HEIGHT
1	Celt	Greenstone	$5\frac{3}{8}$	2	
2	"	Brown sandstone	$4\frac{5}{8}$	$2\frac{1}{8}$	
3	Plummet	Slate	2	.....	
4	Celt	Green striped slate	$3\frac{3}{4}$	$3\frac{1}{8}$	
5	Ornament	Red pipestone	$1\frac{1}{2}$	$\left. \begin{array}{l} +\frac{3}{4} \text{ wide} \\ -\frac{1}{4} \text{ base} \\ \text{nar'w} \\ \text{end} \end{array} \right\}$	
6	Chisel	Brown sandstone	$5\frac{7}{8}$	$1\frac{1}{8}$	
7	Celt	Grey "	$3\frac{7}{8}$	$\frac{9}{16}$	
8	"	Brown "	4	$\frac{3}{4}$	
9	"	Green striped slate	$4\frac{1}{8}$	.....	$\frac{3}{4}$ deep
10	"	Brownish drab sandstone	8	$2\frac{1}{8}$	
11	Chisel	Black basalt	$2\frac{1}{8}$	$\frac{1}{4}$	
12	Celt	Greenstone	$2\frac{1}{4}$	$\frac{3}{8}$	
13	"	Black basalt	3	1	
14	"	" "	$3\frac{7}{8}$	$1\frac{7}{8}$	
15	"	Light olive green slate	$2\frac{3}{4}$	$1\frac{1}{2}$	
16	"	Dark green striped "	$4\frac{1}{2}$	$2\frac{1}{2}$	
17	"	Quartzite	$2\frac{1}{4}$	$1\frac{1}{2}$	
18	"	Brown sandstone	$1\frac{3}{4}$	$\frac{1}{2}$	
18 a	"	Black basalt	$1\frac{3}{4}$	$\frac{3}{4}$	
19	"	Grey sandstone	$5\frac{1}{2}$	$2\frac{1}{4}$	
20	"	Green striped slate	$2\frac{1}{4}$	$1\frac{1}{2}$	
21	"	Light olive green "	$5\frac{1}{8}$	$2\frac{3}{8}$	
22	"	Brown sandstone	$4\frac{1}{8}$	1	
23	"	Striped slate	$6\frac{7}{8}$	$\frac{7}{8}$	$\frac{5}{8}$ deep
24	"	Brown sandstone	$3\frac{3}{8}$	1	
25	"	" "	$2\frac{3}{8}$	$\frac{5}{8}$	
26	"	Dark slate	$11\frac{1}{2}$	$1\frac{1}{4}$	
27	"	Dark steel grey sandstone	9	$\frac{15}{16}$	
28	Pick or hoe	Polished sandstone	$9\frac{1}{4}$	.....	$1\frac{3}{4}$ thick
29	Celt	Green slate	$3\frac{1}{2}$	$1\frac{1}{8}$	
30	Adze	Brown sandstone	$9\frac{7}{8}$	$1\frac{3}{8}$	
31	Celt	Grey granite	$1\frac{5}{8}$	$1\frac{7}{8}$	
32	"	Dark green marble	$2\frac{1}{8}$	2	
33	"	Black basalt	$1\frac{1}{2}$	$\frac{13}{16}$	
34	"	" "	$5\frac{3}{8}$	2	
35	"	Basalt	$1\frac{3}{4}$	$1\frac{5}{8}$	
36	Gouge	Bluish striped slate	$7\frac{3}{8}$	$2\frac{1}{8}$	
37	"	Brown hæmatite	$3\frac{3}{4}$	$2\frac{1}{4}$	
38	"	" sandstone	$3\frac{3}{8}$	$1\frac{1}{2}$	

a For special names of ornaments, see description in bulletin.

EXPLANATION OF PLATES, *continued*

FIG.	NAME	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	DEPTH OR HIGHT
39	Gouge	Black basalt	2 $\frac{7}{8}$	1 $\frac{1}{4}$	
40	"	Grey sandstone	4 $\frac{5}{8}$	1 $\frac{3}{4}$	
41	Ornament	Red pipestone	1+		
42	Gouge	Greenstone	6 $\frac{1}{4}$	2 $\frac{1}{2}$	
43	"	Mottled "	4 $\frac{3}{4}$	2	
44	Ornament	Sandstone	1	1	$\frac{3}{8}$
45	Gouge	Black basalt	8 $\frac{1}{4}$	2 $\frac{1}{4}$	
46	Ornaments (3)	Stone beads	$\frac{1}{2}$	$\frac{1}{2}$	
47	Stone ball	Black slate	1	$\frac{1}{8}$	
48	Beads	Slate	$\frac{1}{16}$	$\frac{1}{8}$	
49	Stone ball	Dark grey quartzite		2 $\frac{1}{8}$ diam	
50	Ornament	Sandstone	$\frac{7}{8}$		
51	Stone ball	Pink quartzite		2 $\frac{1}{2}$ diam	
52	Ornaments	Clay concretions	various		
53	Stone ball	Black slate	1	$\frac{7}{8}$ diam	
54	Gouge	Dark olive green slate	5	2	
55	"	Ironstone	4 $\frac{1}{8}$	1 $\frac{7}{8}$	
56	Ornament	Pipestone	3 $\frac{1}{2}$	1 $\frac{1}{4}$	
57	"	Red slate	1		
58	"	"		1 $\frac{1}{4}$ diam	
59	"	Pipestone		1+	
60	"	"	1 $\frac{5}{8}$	1 $\frac{1}{8}$	
61	Gouge	Mottled stone	4 $\frac{1}{8}$	2 $\frac{3}{8}$	
62	Pebble	Brown sandstone		3 $\frac{3}{8}$ diam	1 $\frac{1}{2}$ thick
63	Pestle	Grey "	7		
64	Double muller	Grey sandstone	3 $\frac{1}{2}$	3 $\frac{1}{2}$	2 $\frac{7}{8}$ deep
65	Pestle	Sandstone	3 $\frac{3}{8}$	1	
66	Adze	Black slate	4 $\frac{1}{2}$	3 $\frac{3}{4}$	
67	Pestle	Brown sandstone	8 $\frac{3}{4}$	2 $\frac{1}{4}$	
68	" (carved)	" "	15	2 $\frac{1}{2}$	
69	" "	Sandstone	6 $\frac{3}{4}$	1 $\frac{3}{4}$	
70	"	"	9 $\frac{1}{2}$	2 $\frac{1}{4}$	
71	"	Brown sandstone	8 $\frac{3}{8}$	1 $\frac{3}{4}$	1 $\frac{1}{8}$ thick
72	Celt and gouge	Grey "	2 $\frac{3}{4}$	1 $\frac{3}{4}$	
73	Pestle	Brown sandstone	5 $\frac{1}{4}$	2 $\frac{1}{4}$	
74	"	"	2 $\frac{1}{2}$	1 $\frac{3}{4}$	
75	"	Grey sandstone	4 $\frac{1}{8}$	2 $\frac{1}{4}$	
76	Muller	Sandstone (pebble)	$\frac{3}{4}$	$\frac{3}{4}$	
77	Sect'n of a vessel	Potstone		20 across handles	10 high
78	P'ce of potstone	"	2	1 $\frac{1}{2}$	1 deep
79	Notched pot-stone rim	"		3 $\frac{1}{4}$	2 $\frac{3}{4}$
80	Sinker	"	2 $\frac{3}{8}$	1 $\frac{1}{8}$	
81	Handle	"		1 $\frac{1}{2}$	1 $\frac{1}{2}$ proj.
82	Ornament	Pipestone		1 diam	

a Not given.

b Use unknown.

EXPLANATION OF PLATES, *continued*

FIG.	NAME	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	DEPTH OR HEIGHT
83	Handle	Potstone .....	.....	3	2 $\frac{1}{4}$ proj.
84	Ornament	Light drab slate	1 $\frac{3}{4}$	$\frac{1}{4}$	
85	Pestle	Brown sandstone	1 $\frac{3}{8}$	$\frac{3}{4}$	$\frac{1}{16}$
86	Sinew stone	"	3 $\frac{7}{8}$	1 $\frac{5}{8}$	
87	Ornament	Pipestone .....	.....	$\frac{11}{16}$	
88	Beads	Slate	$\frac{7}{8}$	.....	
89	Pestle	Brown sandstone	4 $\frac{5}{8}$	1 $\frac{3}{8}$	
90	Plummet	Dark "	4 $\frac{1}{2}$	.....	1 $\frac{1}{8}$ thick
91	"	Grey "	4 $\frac{1}{4}$	.....	1 $\frac{1}{2}$ "
92	"	Red "	3 $\frac{5}{8}$	1 $\frac{1}{2}$	
93	"	Greenstone	3 $\frac{1}{2}$	1 $\frac{1}{2}$	
94	"	Red granite	2	1 $\frac{3}{4}$	
95	"	Hornblendic gneiss	2 $\frac{1}{2}$	1 $\frac{1}{8}$	
96	"	Greenstone	3	1 $\frac{3}{8}$	
97	Pipe	Black soapstone .....	.....	.....	4 $\frac{1}{2}$ high
98	"	Yellow sandstone .....	.....	.....	1 $\frac{7}{8}$ "
99	"	Dark soapstone .....	.....	.....	1 $\frac{7}{8}$ "
100	"	Black marble	4 $\frac{3}{4}$	.....	1 $\frac{1}{4}$ deep
101	"	White " .....	.....	.....	2 $\frac{3}{8}$ high
102	" bowl	Dark soapstone .....	.....	.....	1 $\frac{7}{8}$ "
103	Bird pipe	" green slate .....	.....	.....	7 $\frac{1}{2}$ "
104	Pipe	Yellowish grey stone	2 $\frac{1}{2}$	2 $\frac{1}{4}$	$\frac{7}{8}$ "
105	"	Soapstone .....	.....	1 $\frac{3}{4}$ (?)	1 $\frac{1}{2}$ "
106	"	Black marble	3 $\frac{3}{8}$ fr. tip to	.....	
107	"	Grey quartzite .....	.....	.....	2 $\frac{1}{4}$ "
108	"	Dark soapstone .....	.....	.....	1 $\frac{1}{2}$ — "
109	"	Dark slate	5 $\frac{1}{8}$	.....	2 $\frac{1}{4}$ "
110	"	Grey stone	3 $\frac{1}{2}$	.....	2 "
111	"	Brown sandstone .....	.....	.....	2 "
112	"	Sienna marble .....	.....	.....	1 $\frac{3}{4}$ thick
113	"	Sandstone .....	.....	.....	2 $\frac{1}{4}$ high
114	"	Sandstone .....	.....	.....	2 $\frac{1}{2}$ deep
115	"	Dark stone .....	.....	.....	3 $\frac{1}{2}$ high
116	"	Crystalline "	3 $\frac{3}{4}$	.....	
117	"	Sandstone .....	.....	.....	2 $\frac{3}{4}$ high
118	"	Sandstone .....	.....	.....	1 $\frac{1}{4}$ deep
117	Bird pipe	Green slate	3 $\frac{3}{4}$	.....	
118	Pipe	Steatite	3 $\frac{3}{4}$	1 diam	
119	"	Grey limestone .....	.....	.....	2 high
120	"	Dark soapstone	2 $\frac{3}{4}$	.....	
121	Muller	Greenstone .....	.....	4	2 deep
122	Tube	Dark green striped slate	3 $\frac{1}{2}$	1 $\frac{1}{4}$	
123	"	Grey striped slate	5 $\frac{5}{8}$	1 diam	
124	"	Light olive green slate	3 $\frac{1}{4}$ +	.....	
125	"	Striped green slate	7	.....	

EXPLANATION OF PLATES, *continued*

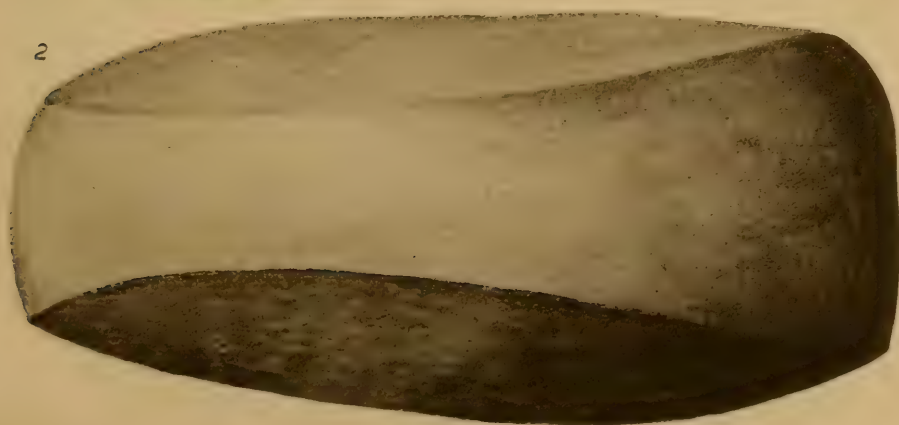
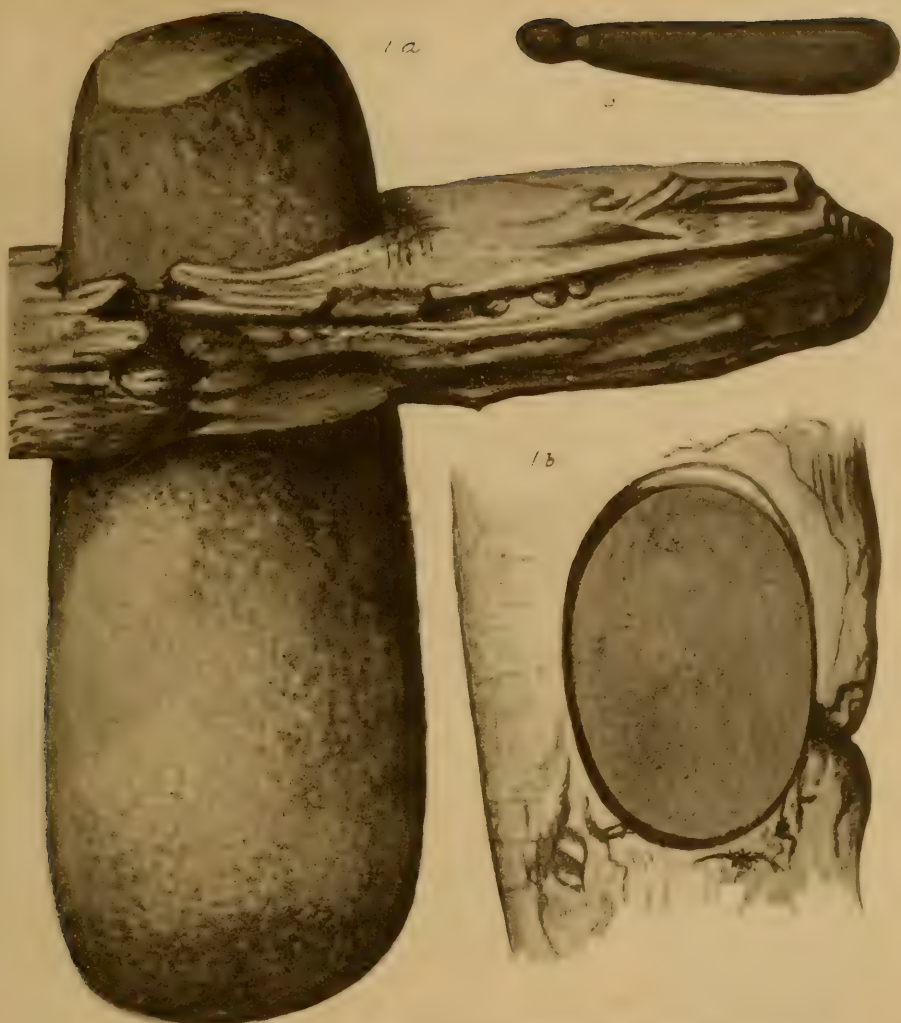
FIG.	NAME	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	DEPTH OR HIGHT
126	Ornament	Greenish slate . . . . .	.....	$\frac{11}{16}$ long diam	
127	"	"	$\frac{11}{16} +$	.....	
128	Tube	Sandstone (?)	$9\frac{1}{2}$	$1\frac{1}{8}$ diam	
129	"	Sandstone	$4\frac{1}{2}$	$1\frac{1}{4}$ diam	
130	"	Soapstone	$8\frac{1}{2}$	.....	
131	Bayonet slate	Bluish striped slate	$8\frac{7}{8}$	$\frac{7}{8}$	
132	"	Striped slate	$4\frac{7}{8}$	.....	
133	Plummet	Brown sandstone	$2\frac{5}{16}$	$1\frac{3}{8}$	
134	"	Quartz	$2\frac{1}{2}$	$1\frac{1}{4}$	
135	Amulet	Green striped slate . . . . .	.....	$9\frac{7}{8}$ fr. tip to tip	
136	"	"	$3\frac{1}{2}$	.....	$1\frac{1}{2}$ high
137	"	"	$6\frac{1}{8}$	3 at tail	
138	"	Pipestone	$2\frac{3}{16}$	.....	
139	"	Green striped slate	$3\frac{1}{4}$	.....	
140	"	Trap rock	$6\frac{7}{8}$	.....	$1\frac{1}{2}$ high
141	"	Mottled stone	$3\frac{3}{8}$	.....	$1\frac{3}{4}$ "
142	"	Green striped slate	$4\frac{1}{2}$	.....	1 high at tail
143	"	"	5	.....	$1\frac{3}{4}$ high
144	"	"	$3\frac{3}{8}$	.....	$1\frac{3}{8}$ "
145	"	Grey	$5\frac{5}{8}$	.....	
146	"	Mottled dark stone	$4\frac{1}{2}$	$1\frac{3}{4}$	
147	"	Dark green striped slate	$5\frac{7}{8}$	$\frac{3}{4}$	$\frac{3}{4}$ high
148	Ornament	Pipestone	$\frac{5}{8}$	.....	
149	"	"	$1\frac{9}{16}$	$\frac{1}{8}$	
150	"	"	$\frac{3}{16}$	.....	
151	Pipe	Dark green soapstone	3	.....	$1\frac{1}{8}$ thick
152	"	Green sandstone	$3\frac{3}{4}$	.....	
153	"	Stone	$3\frac{5}{8}$	.....	
154	Boat stone	Striped slate	$4\frac{7}{8}$	$1 +$	$\frac{7}{8}$ high
155	"	Green striped slate	$3\frac{3}{4}$	$1\frac{1}{8}$	$\frac{3}{4}$ "
156	"	Brown slate	$3\frac{1}{8}$	.....	$1\frac{1}{8}$ "
157	"	Green striped slate	$5\frac{1}{2}$	.....	$1\frac{3}{8}$ "
158	"	"	$4\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$ "
159	Cup	D'k blue gr'n striped slate . . . . .	.....	$2\frac{3}{4}$	
160	"	Soapstone . . . . .	.....	$2\frac{5}{8}$ long diam	
161	D'bleedg'd knife	Grey slate	$2\frac{3}{8}$	$1\frac{1}{4}$	
162	Ornament	Brown sandstone . . . . .	.....	1 diam	
163	Cup . . . . .	" . . . . .	.....	$1\frac{1}{4}$	
164	D'bleedg'd knife	Grey slate	$2\frac{1}{4}$	$1\frac{1}{4}$	
165	Sinker (?)	Light greenish slate	$4\frac{3}{4}$	$\frac{3}{4}$	
166	D'bleedg'd knife	Dark slate	$5\frac{5}{8}$	$1\frac{1}{4}$	
167	"	Grey	$3\frac{3}{4}$	$1\frac{3}{8}$	
168	"	Dark	$1\frac{5}{8}$	.....	
169	"	"	$2\frac{1}{2}$	1	
170	"	Red	$1\frac{5}{8}$	$1\frac{1}{8}$	

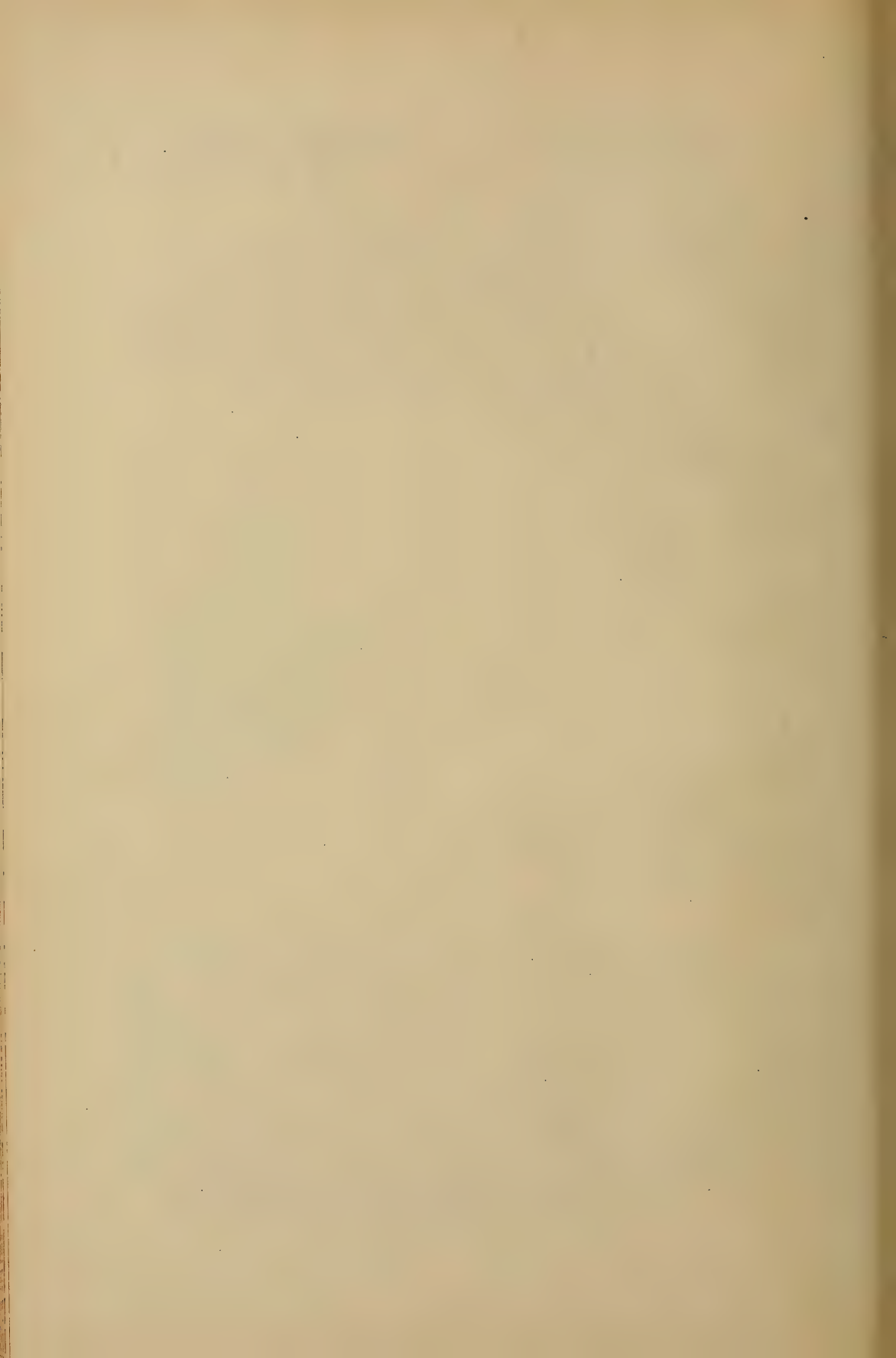
EXPLANATION OF PLATES, *continued*

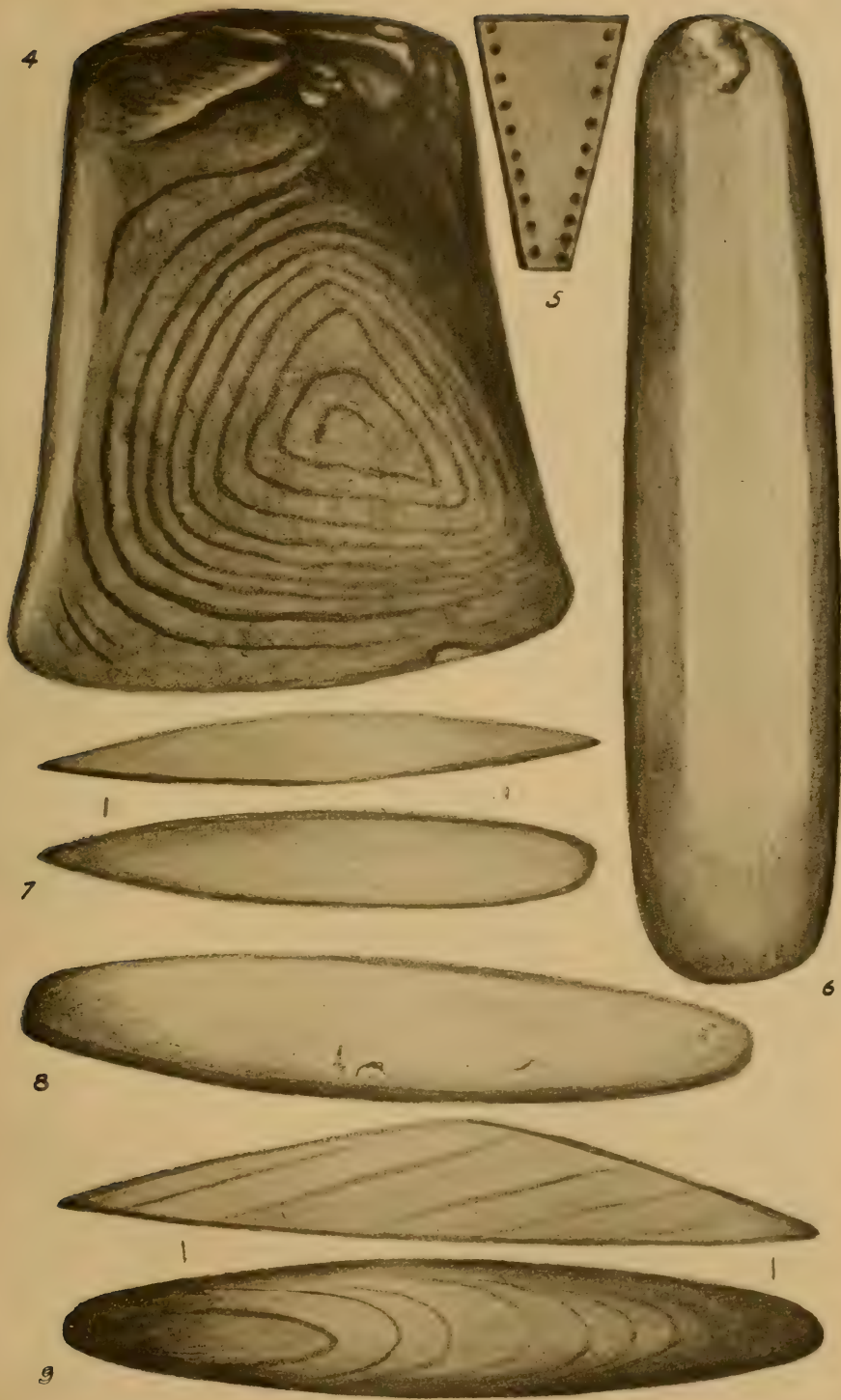
FIG.	NAME	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	DEPTH OR HEIGHT
171	D'ble edg'd knife	Bluish slate.....	2 $\frac{3}{8}$	1 $\frac{1}{4}$	
172	"	Dark "	3	1 $\frac{3}{8}$	
173	"	Grey "	1 $\frac{1}{4}$	$\frac{1}{2}$	
174	Omitted.....				
175	D'ble edg'd knife	Dark "	3 $\frac{3}{4}$	1 $\frac{3}{8}$	
176	"	Grey "	2 $\frac{7}{8}$	1 $\frac{1}{8}$	
177	Woman's knife..	Slaty sandstone.....	2 $\frac{7}{8}$		2 $\frac{1}{4}$ deep
178	"	Hard black slate.....	3		1 $\frac{1}{8}$ "
179	"	Brown sandstone.		5 $\frac{1}{2}$	2 "
180	"	Grey sandstone.....		6 $\frac{1}{8}$	2 $\frac{1}{4}$ "
181	Ornament.....	Pipestone	2 $\frac{1}{8}$	1+	
182	"	"	1 $\frac{5}{16}$	$\frac{3}{8}$	
183	"	"	1	$\frac{3}{4}$	
184	Hammer stone..	Light green slate.....		4 $\frac{3}{8}$	2 $\frac{3}{4}$ deep
185	"	Green striped slate.. .	4	1 $\frac{1}{8}$	$\frac{3}{4}$ "
186	"	" " "		5 $\frac{3}{8}$	4 $\frac{1}{2}$ "
187	"	Striped slate		5 $\frac{1}{2}$	2 $\frac{5}{8}$ "
188	"	" " "		4 $\frac{5}{8}$	1 $\frac{7}{8}$ "
189	"	Olive green slate		2 $\frac{3}{4}$	4 $\frac{1}{8}$ "
190	Ornament.....	Pipestone			
191	Hammer stone..	Green striped slate.....		2 $\frac{5}{8}$ diam	
192	"	Greenish crystalline stone.....		6 $\frac{3}{8}$	2 deep
193	"	Olive brown striped slate.....		3 $\frac{5}{8}$	2 "
194	Ornament.....	Pipestone	1	$\frac{1}{2}$	
195	"	"	1 $\frac{7}{8}$	1	
196	"	Marble		$\frac{7}{8}$	1 $\frac{1}{8}$
197	"	"		1	1
198	"	Pipestone	$\frac{3}{4}$		
199	"	"		1 $\frac{1}{8}$	$\frac{3}{16}$
200	Hammer stone..	Olive green striped slate.....		7	1 $\frac{1}{4}$ deep
201	"	Black slate	6		1 $\frac{1}{4}$ "
202	Banner stone...	Green striped slate.....		3 $\frac{3}{8}$	1 deep (?)
203	Hammer stone..	" "		3 $\frac{3}{8}$	1 $\frac{1}{2}$ deep
204	"	Light olive green slate..		3	$\frac{3}{4}$ "
205	"	Striped slate.....		2 $\frac{1}{2}$	1 $\frac{1}{2}$ " 3 $\frac{1}{4}$ thick
206	Gorget.....	Yellowish olive quartzite	4 $\frac{5}{8}$	1 $\frac{1}{2}$	
207	"	Brown striped slate.....	4 $\frac{1}{8}$	2 $\frac{3}{8}$	
208	"	Green ribbon stone.....	4 $\frac{1}{8}$	1 $\frac{3}{4}$ at base	
209	"	" striped slate.....	3 $\frac{3}{8}$	2 $\frac{1}{8}$	
210	Ornament	Pipestone	2 $\frac{3}{8}$	$\frac{3}{8}$	
211	Gorget.....	Dark olive slate		6 $\frac{1}{2}$ at base	6 $\frac{3}{8}$ high
212	"	Bluish grey "	6 $\frac{1}{2}$	4 $\frac{3}{4}$ 1 $\frac{3}{8}$	

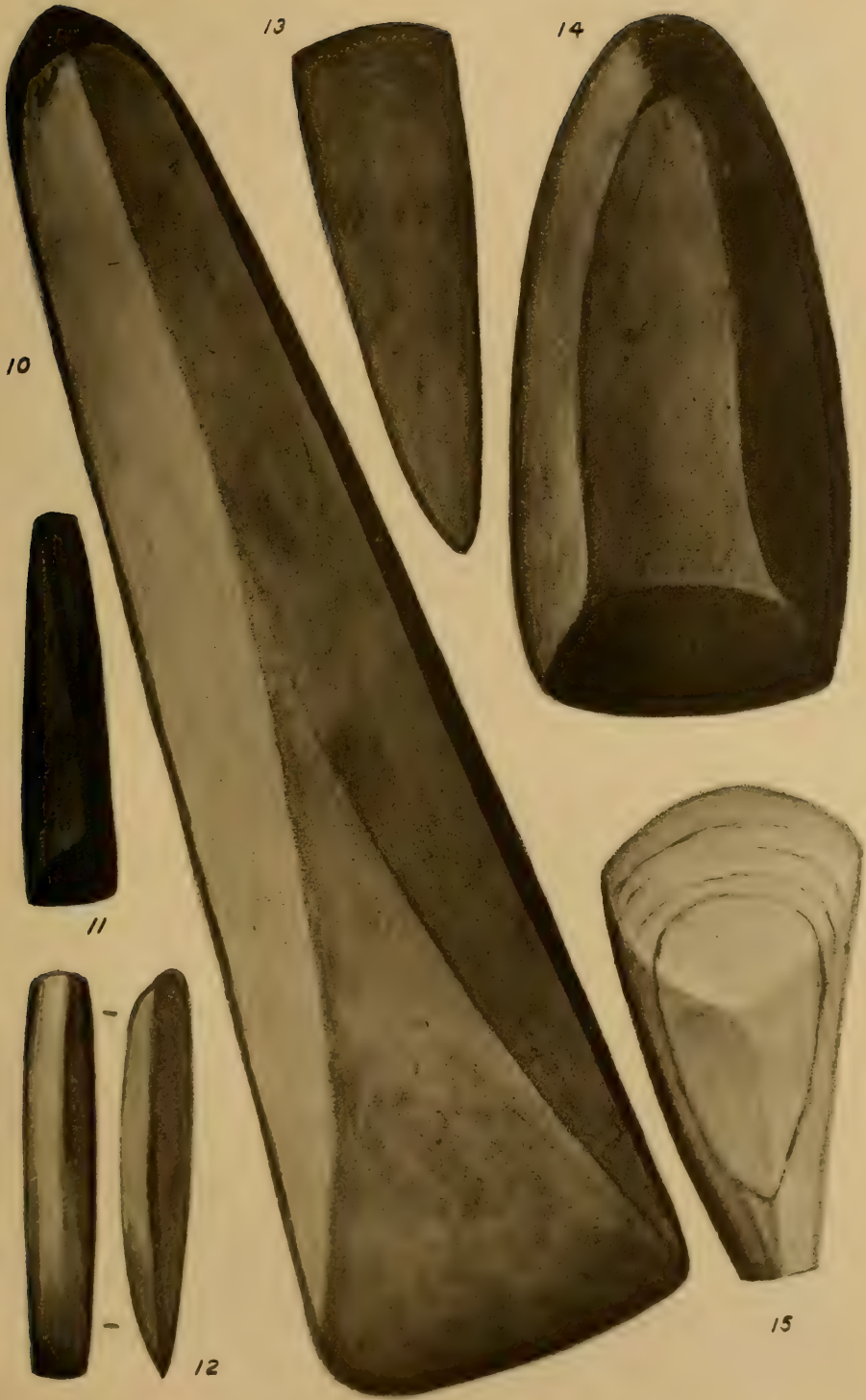
EXPLANATION OF PLATES, *continued*

FIG.	NAME	MATERIAL	LENGTH IN INCHES	WIDTH IN INCHES	DEPTH OR HEIGHT
213	Gorget.....	Red slate	5 $\frac{3}{4}$ }	2 $\frac{3}{4}$ oad end 3 $\frac{1}{4}$ nar'w end	
214	Boat stone....	Brown slate	5 $\frac{1}{8}$	1 $\frac{1}{4}$	$\frac{7}{8}$ high
215	Grooved axe...	Light greenish slate....	5 $\frac{3}{4}$	2 $\frac{1}{2}$	
216	Plummet	Green basalt.....	1 $\frac{3}{16}$		1 thick
217	Gorget.....	Grey striped slate.		4 $\frac{1}{8}$	2 $\frac{1}{8}$
218	"	Brown slate	5 $\frac{1}{8}$	2	
219	Flat axe.....	" sandstone	4 $\frac{1}{4}$	2 $\frac{7}{8}$	
220	Pebble.....	" "	2 $\frac{1}{16}$	$\frac{7}{8}$	
221	Polished perf...	" "	2 $\frac{3}{8}$		
222	"	Sandstone	2 $\frac{3}{4}$		
223	Gorget.....	Striped (cr'm & pur.) stone	6	1 $\frac{3}{4}$	
224	"	Striped slate	4 $\frac{1}{2}$	2	
225	Ornament.....	Limestone		1 $\frac{1}{2}$	
226	Mask.....	Pipestone		$\frac{3}{4}$	1
227	"	"		$\frac{9}{16}$	$\frac{5}{8}$
228	"	"		$\frac{3}{4}$	$\frac{3}{4}$
229	Ornament.....	"		$\frac{3}{4}$	
230	"	"		$\frac{11}{16}$	$\frac{1}{2}$
231	"	"		1 $\frac{5}{16}$	$\frac{9}{16}$
232	Mask.....	"		$\frac{1}{4}$	$\frac{5}{8}$
233	"	"		$\frac{7}{16}$	$\frac{1}{2}$
234	Ornament.....	"	3	1 $\frac{5}{8}$	
235	"	"	2 $\frac{5}{8}$	1 $\frac{5}{8}$	
236	Ball (perforated)	Brown sandstone		1 $\frac{7}{8}$	1 $\frac{3}{8}$ deep
237	Ornament.....	Pipestone		1	1 $\frac{3}{16}$
238	Mask.....	Grey marble		1 $\frac{3}{8}$	1 $\frac{3}{4}$
239	Cob. st'ne (carv.)	Sandstone		2 $\frac{1}{2}$	3
240	Ornament.....	Pipestone		1 $\frac{11}{16}$	$\frac{3}{8}$
241	Grooved bould.	Sandstone	18 (?)	15	
242	Ornament	Slate		1 $\frac{1}{8}$	1 $\frac{3}{8}$
243	"	Pipestone	1 $\frac{1}{8}$	$\frac{7}{16}$	
244	"	"	1 $\frac{1}{2}$	$\frac{3}{16}$	
245	Ornament (serp)	Greenish slate..	3 $\frac{7}{8}$	$\frac{3}{4}$	



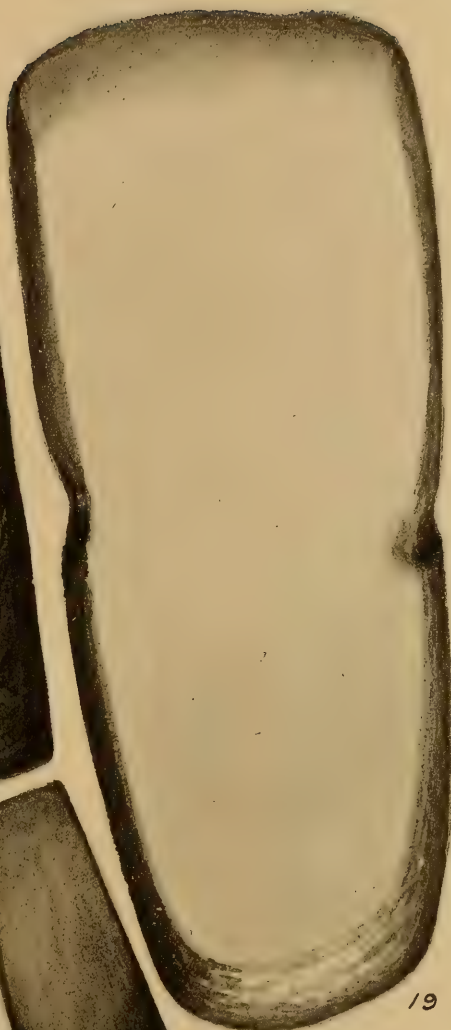








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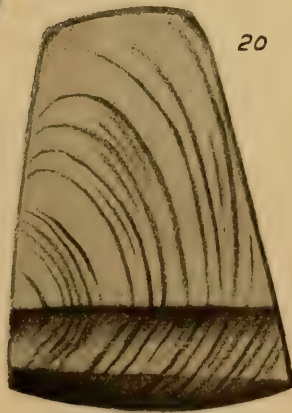
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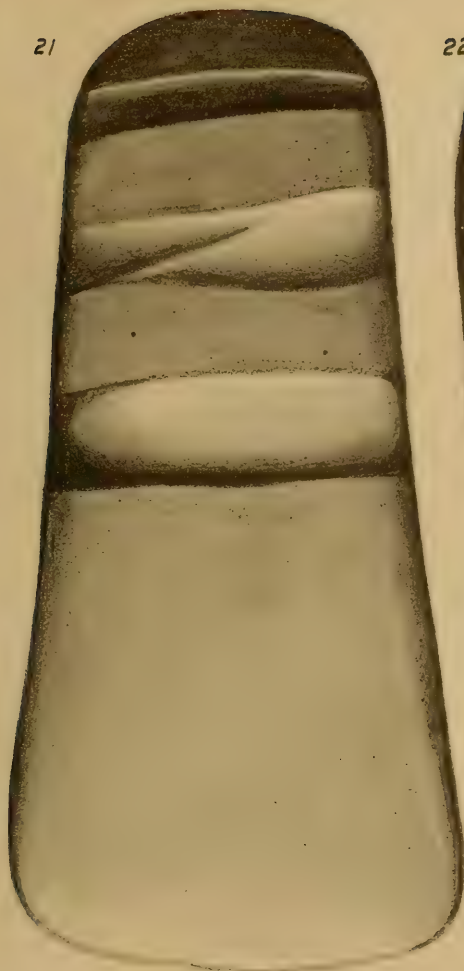


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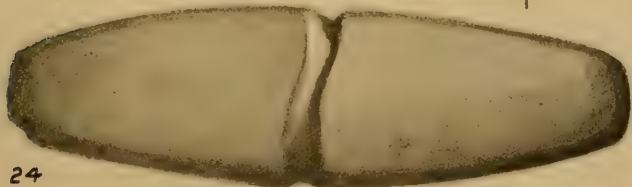
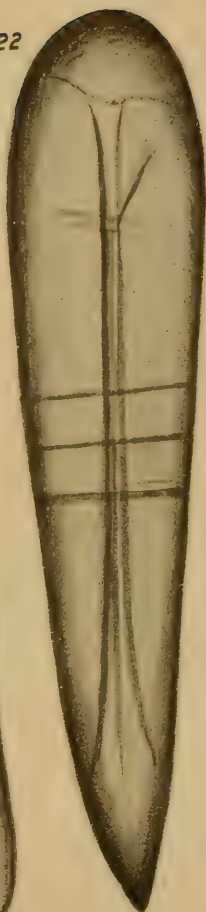


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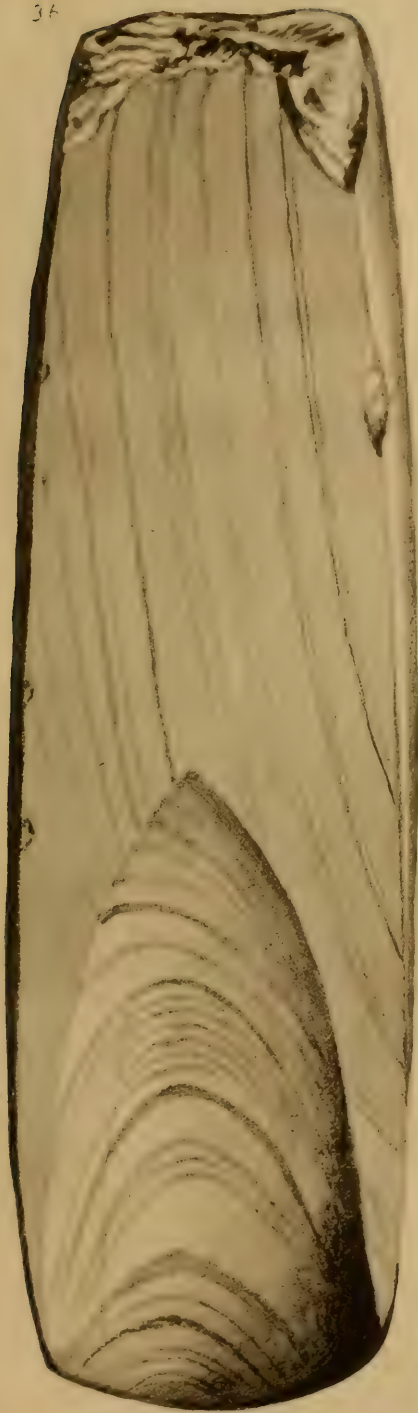
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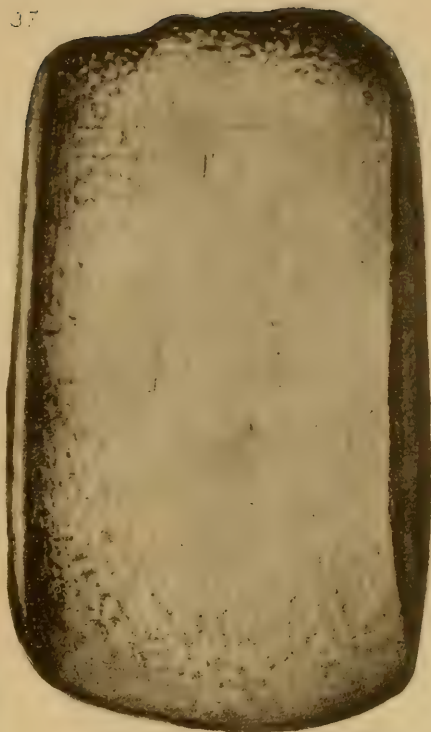
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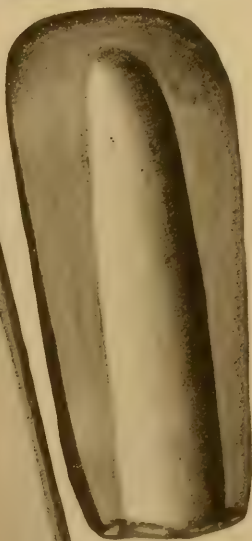
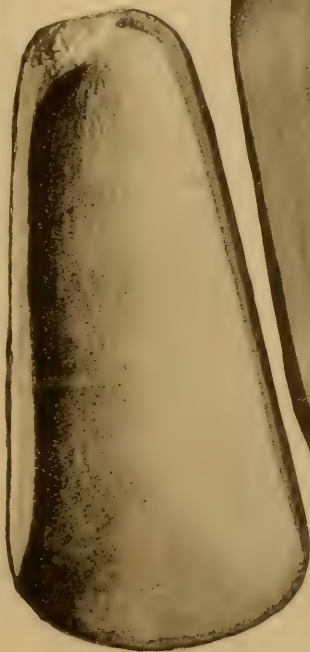
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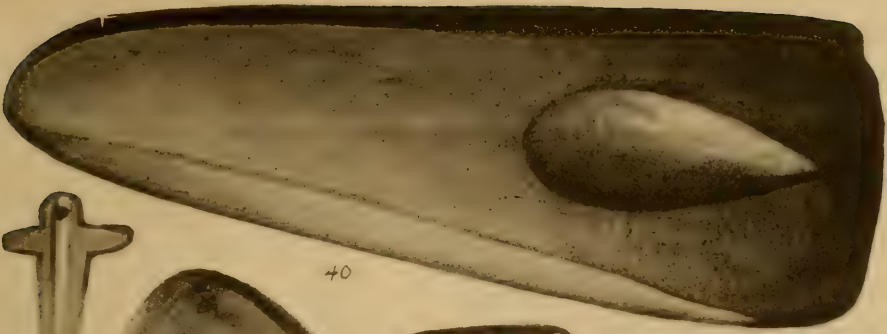
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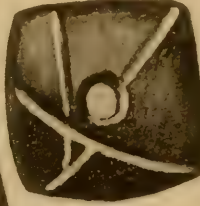
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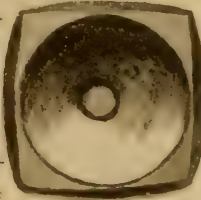
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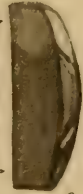
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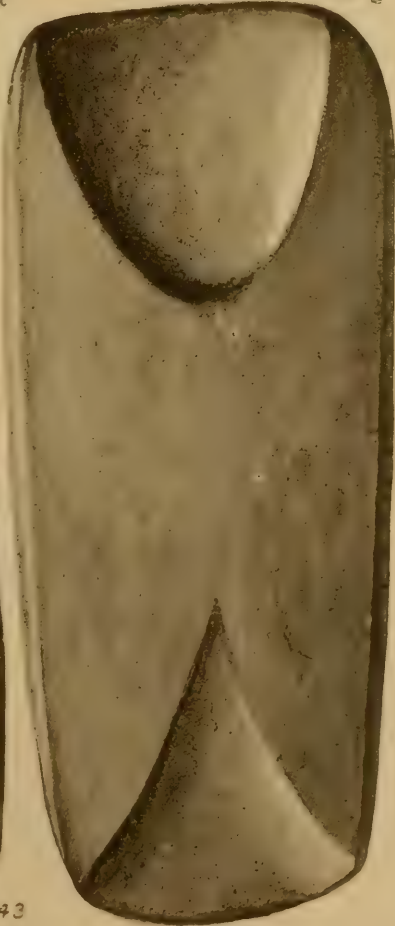
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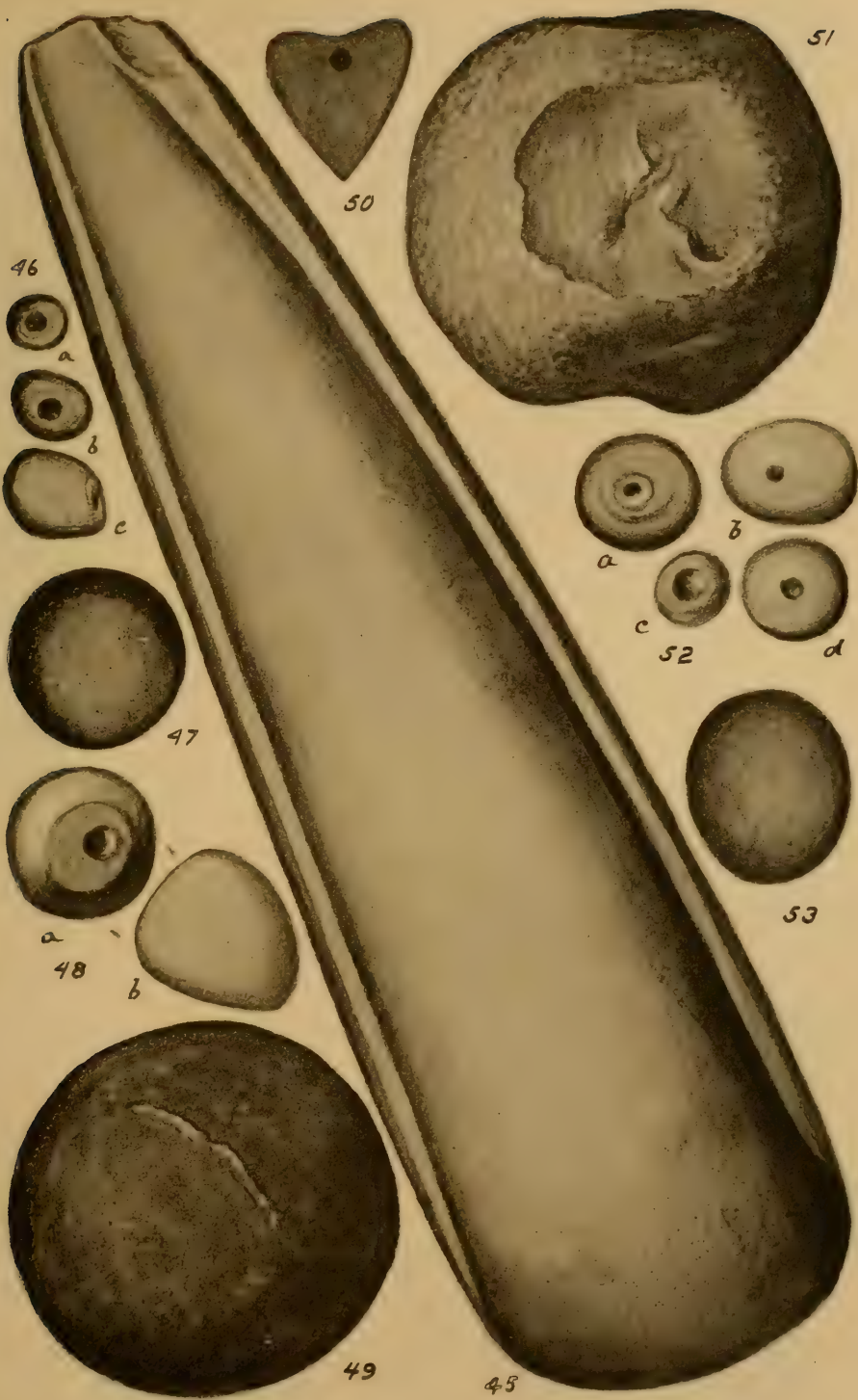
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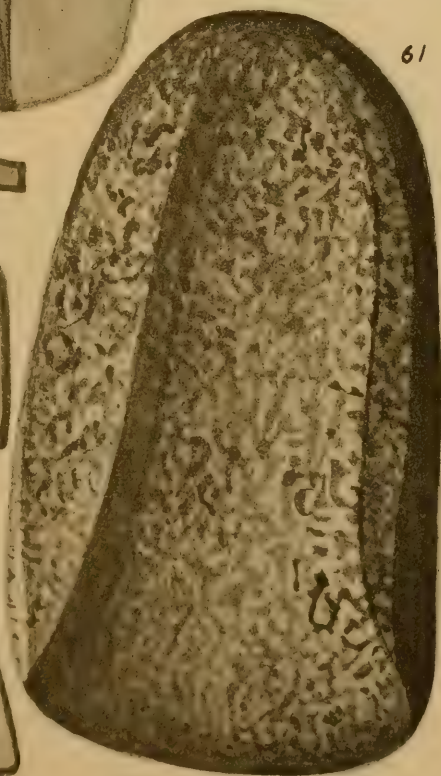
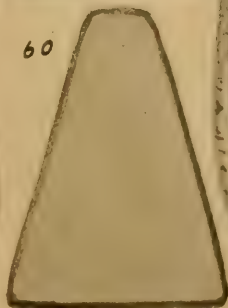
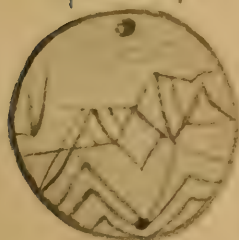
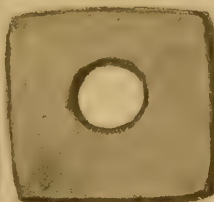
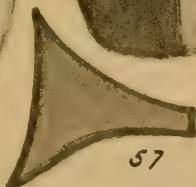
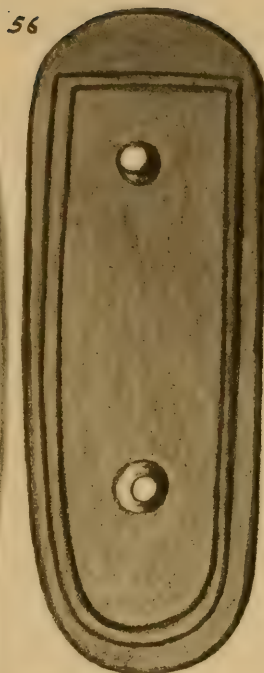
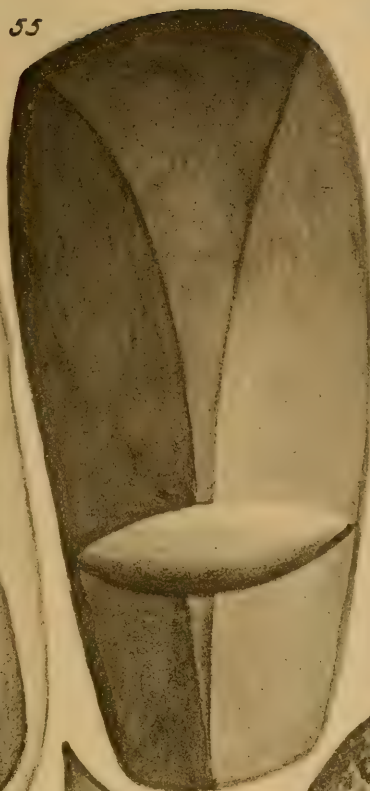
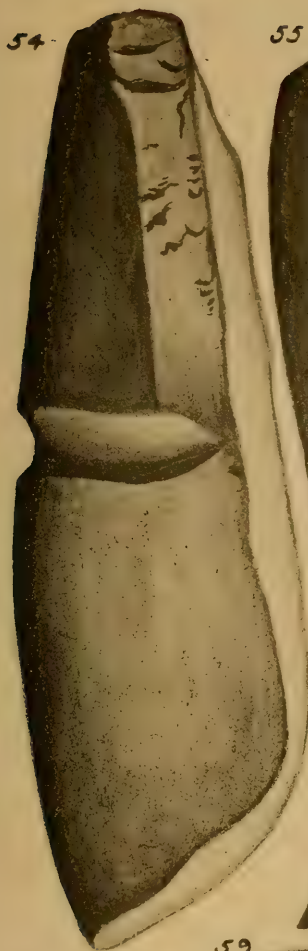


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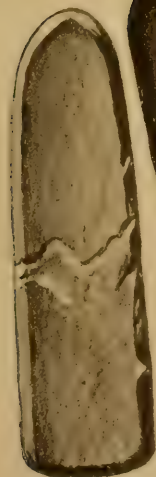
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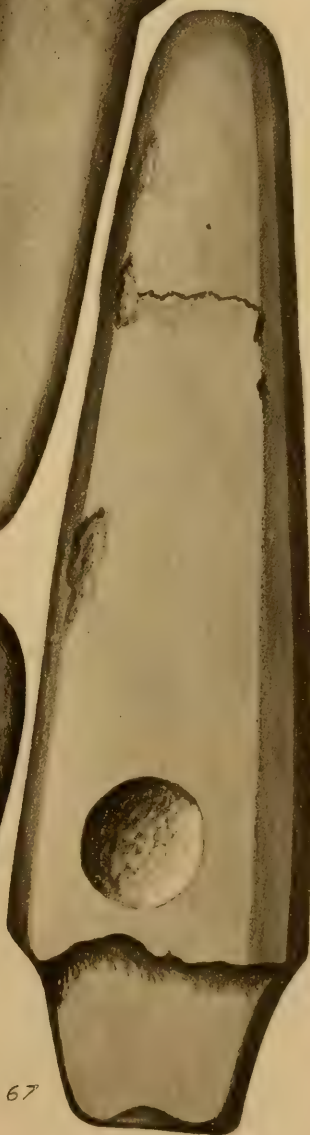
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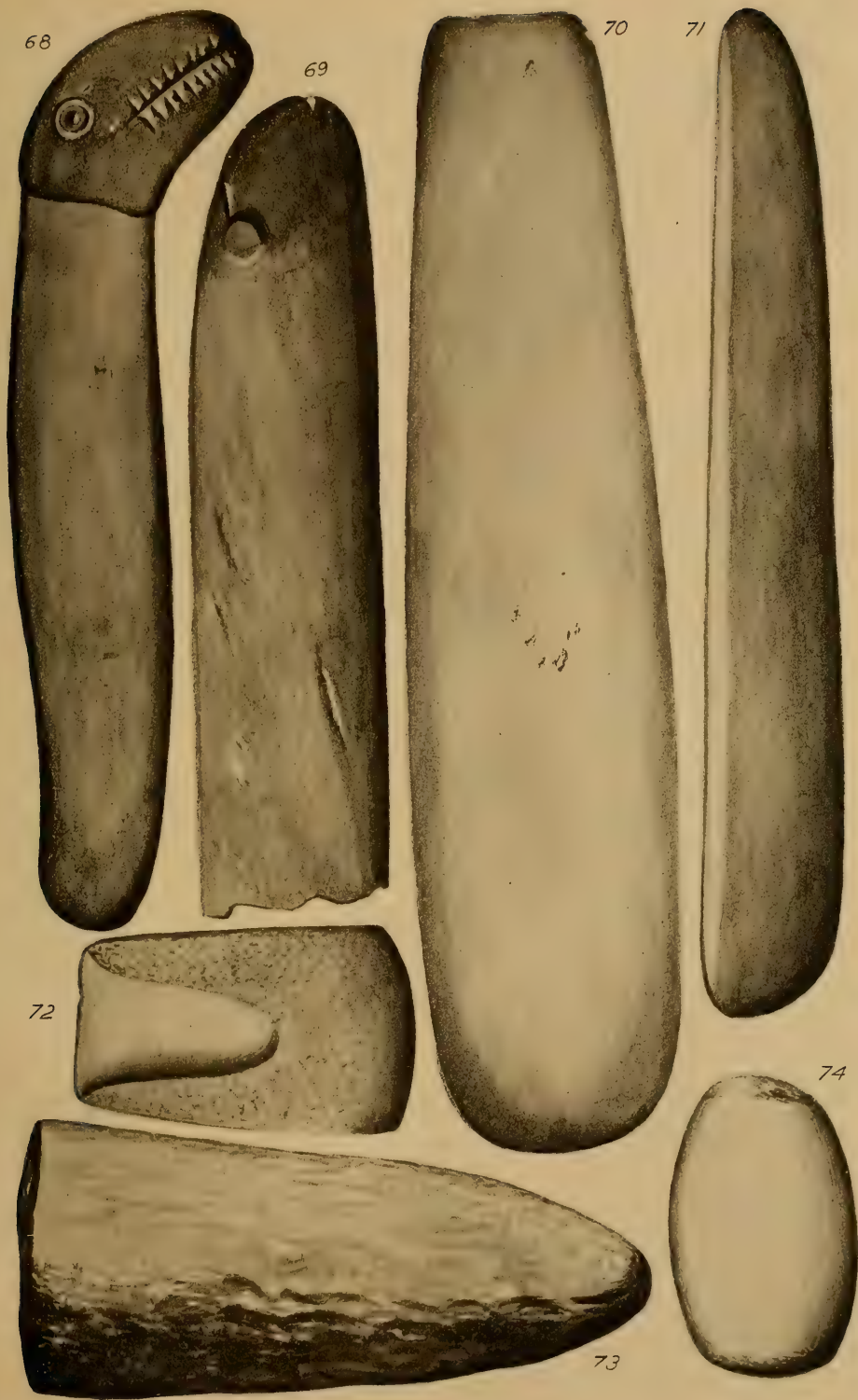
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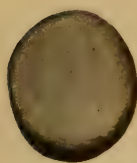


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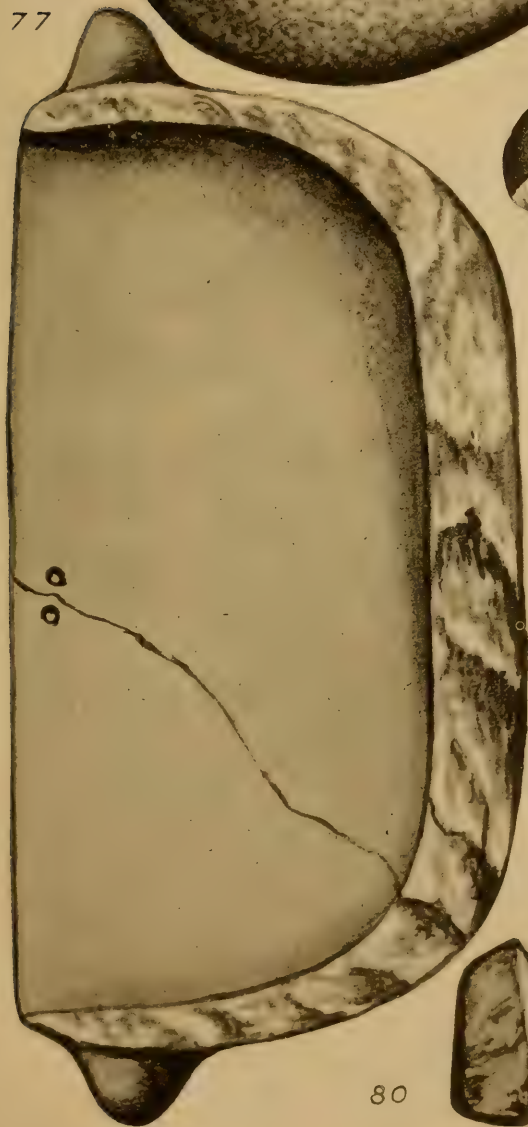


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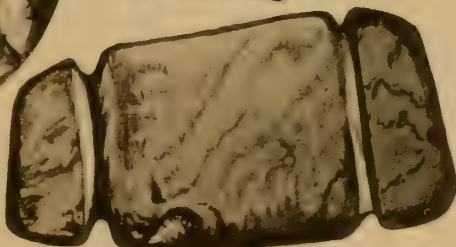
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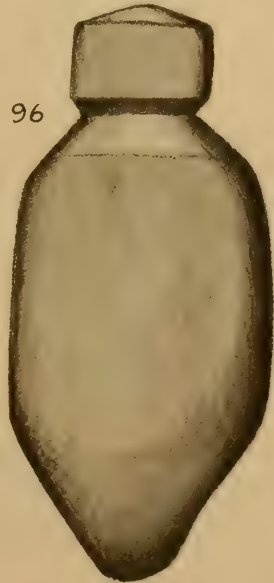
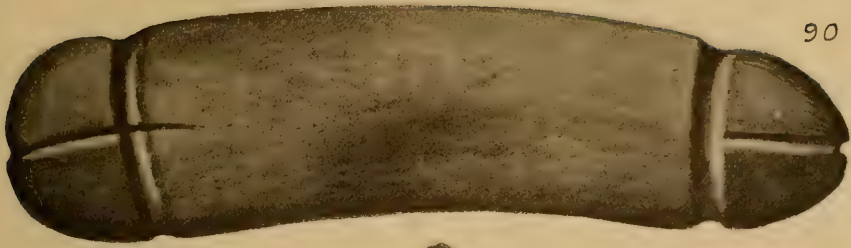
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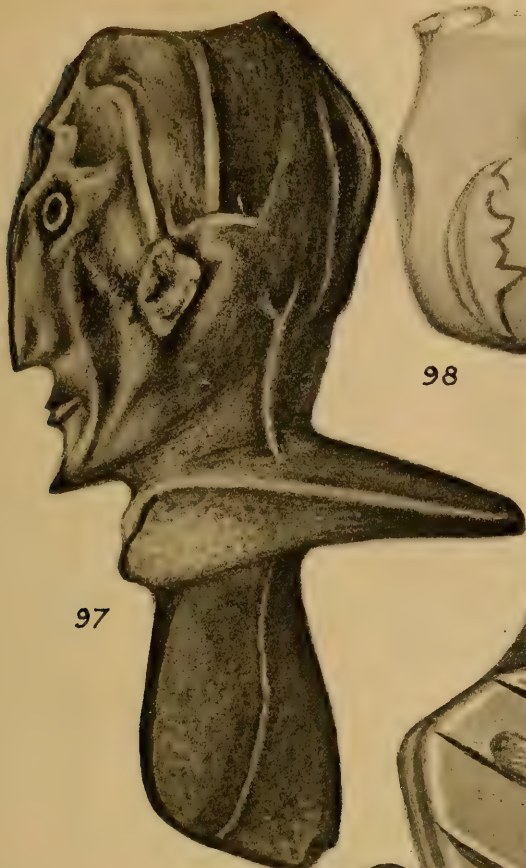


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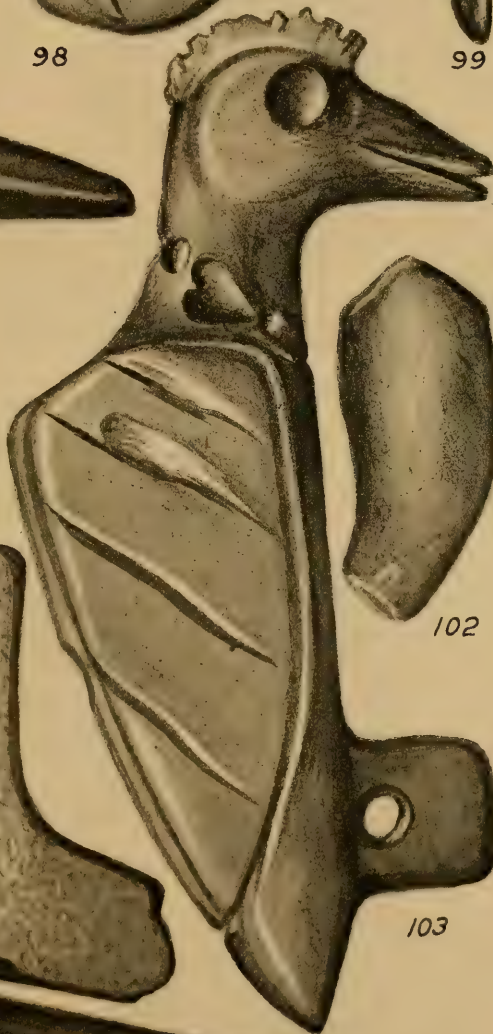
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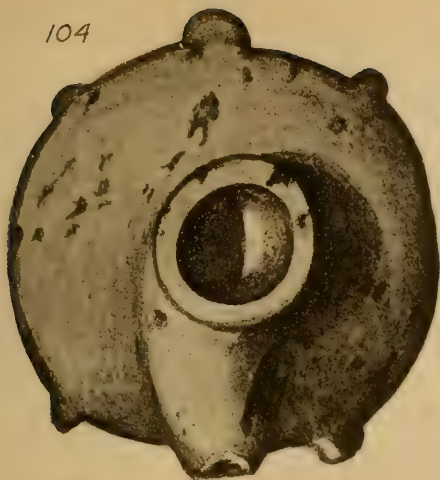
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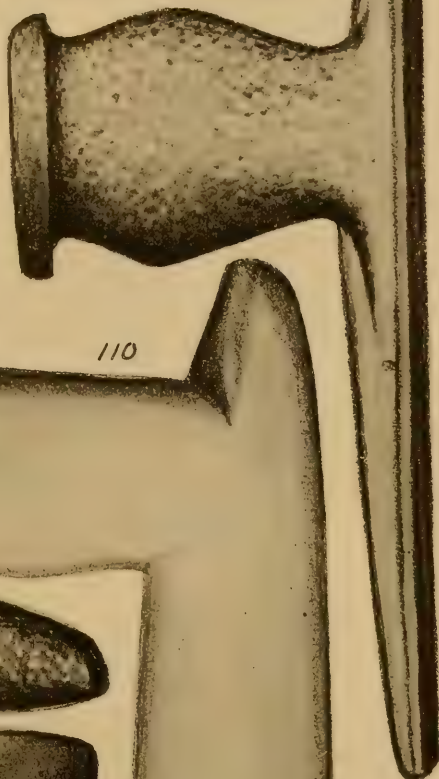
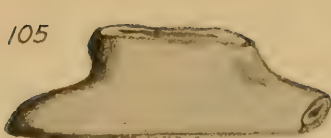
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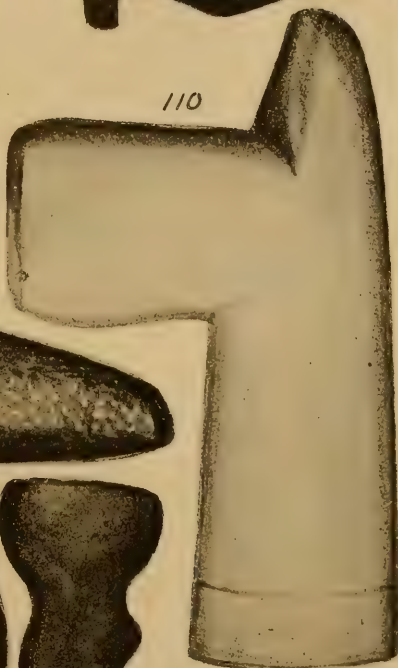
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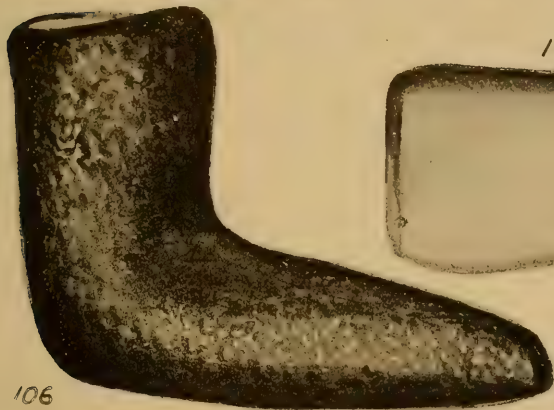


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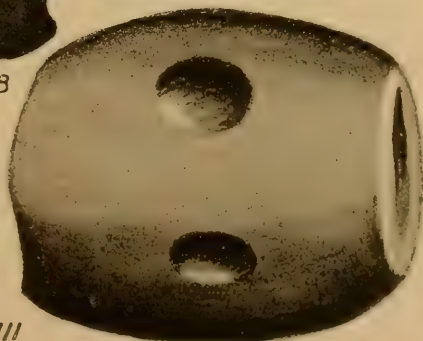


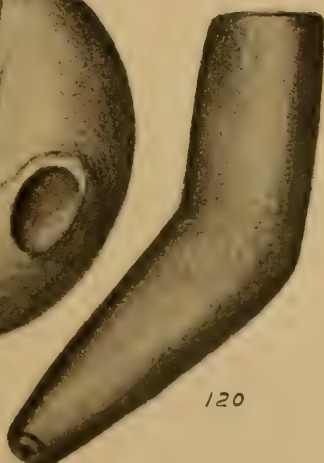
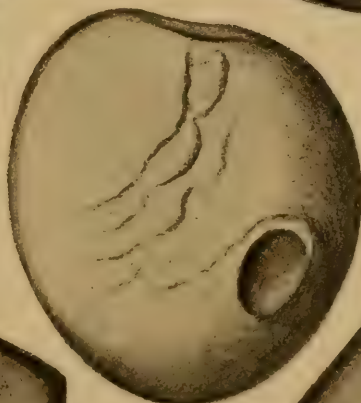
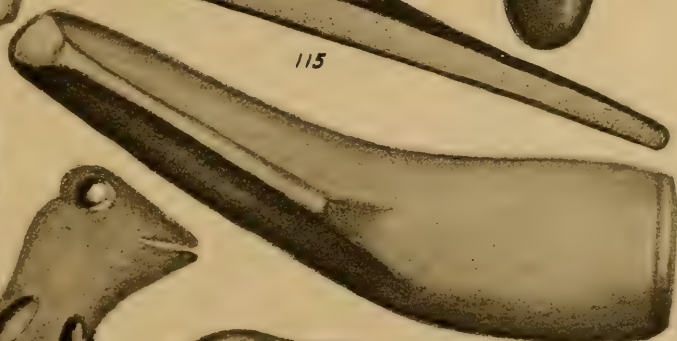
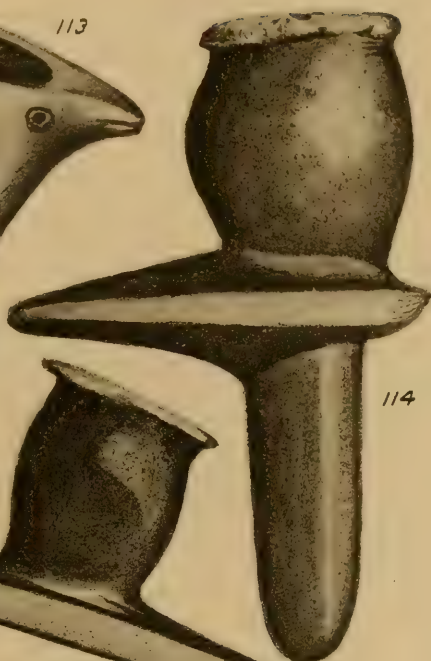
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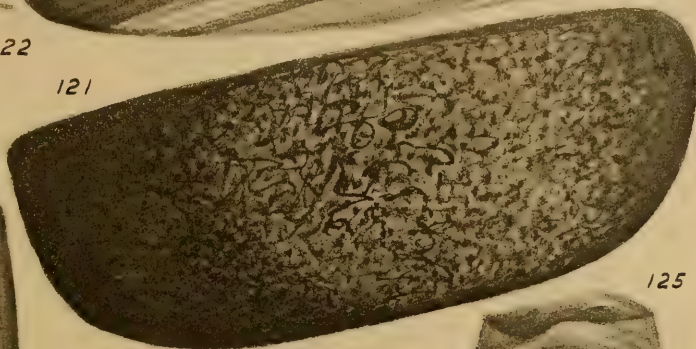




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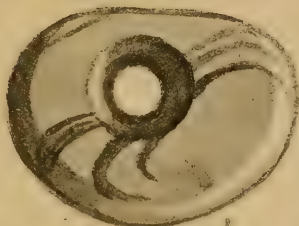


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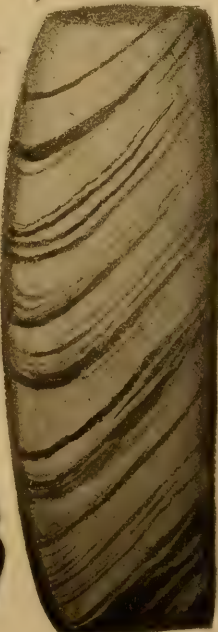
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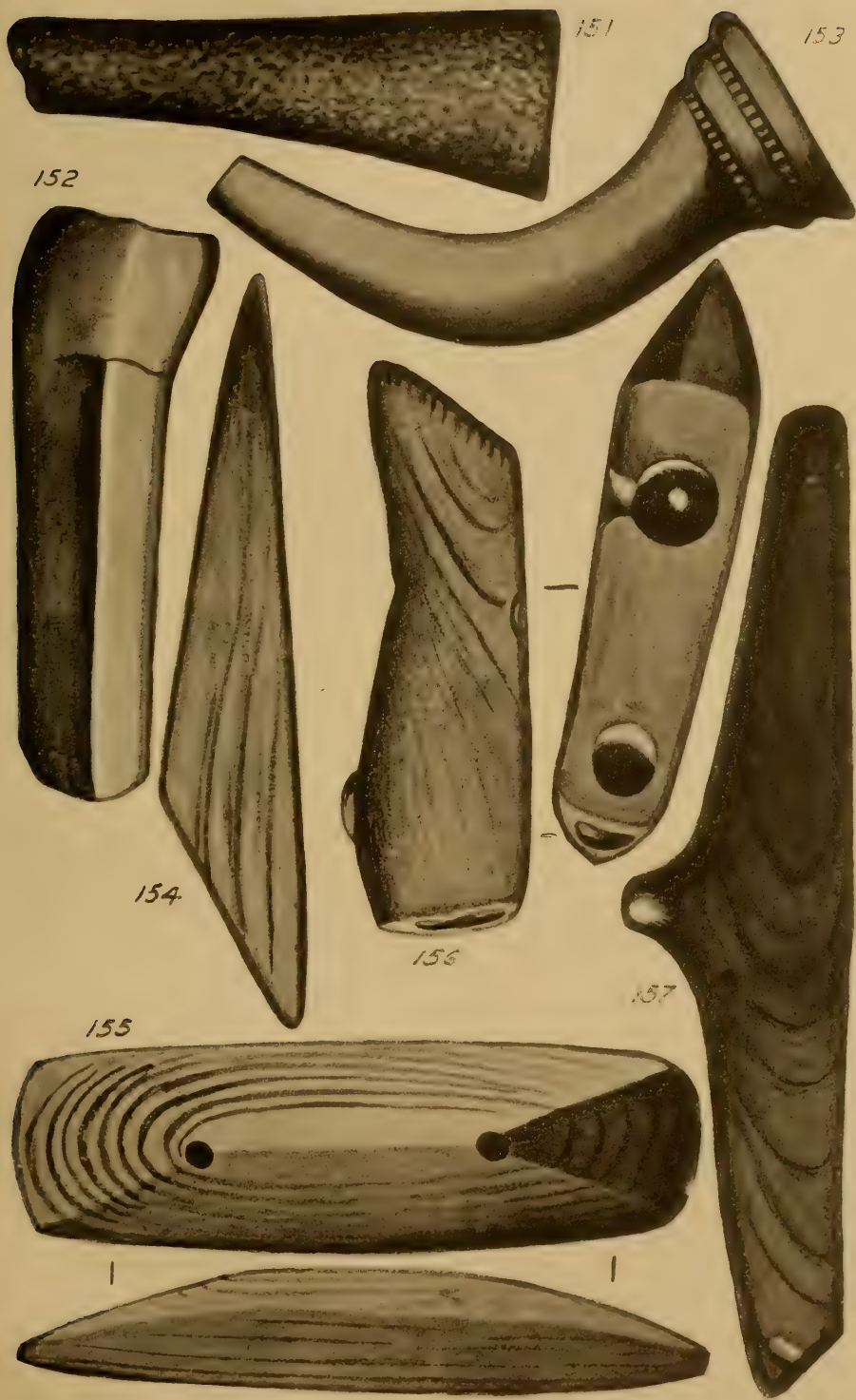
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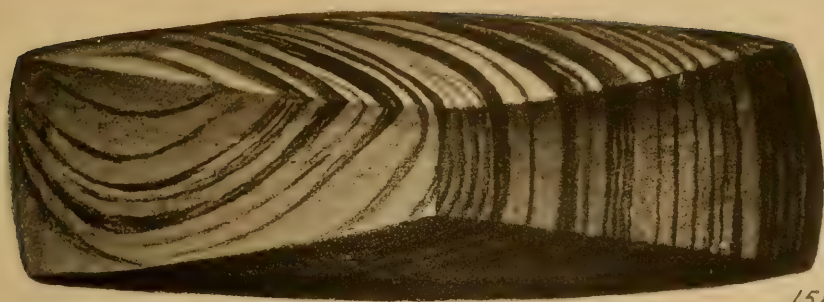




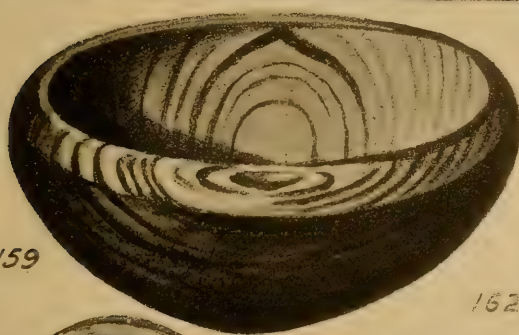








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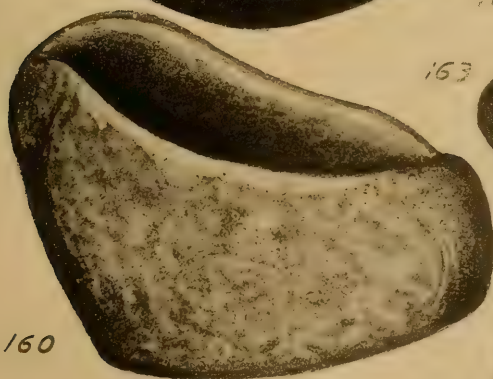
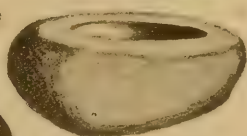
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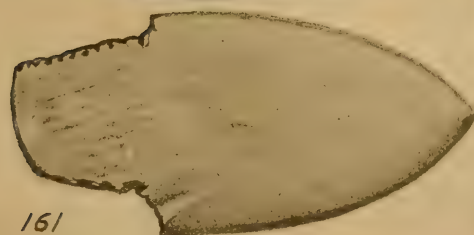
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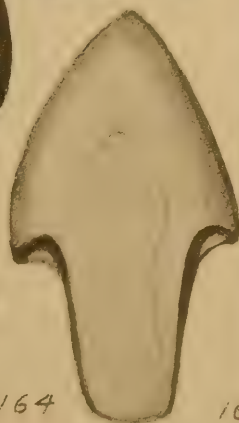
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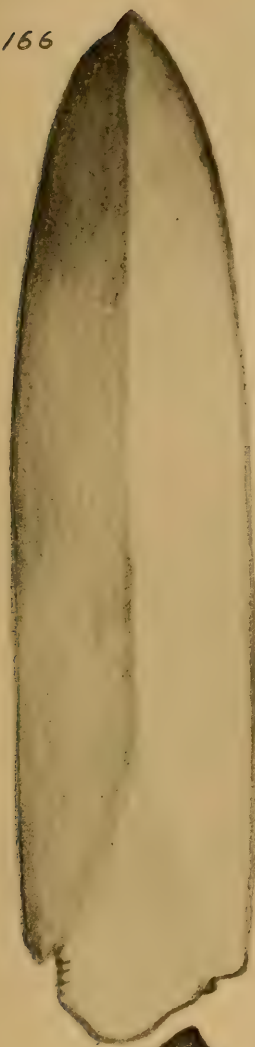


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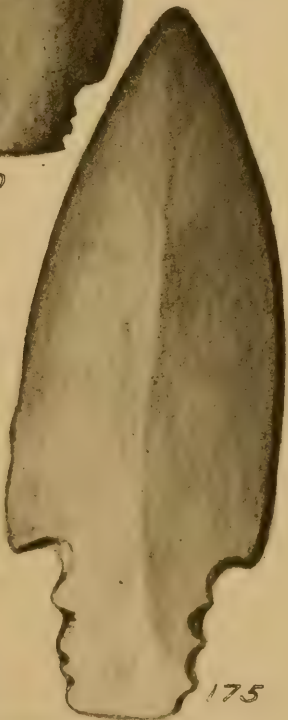


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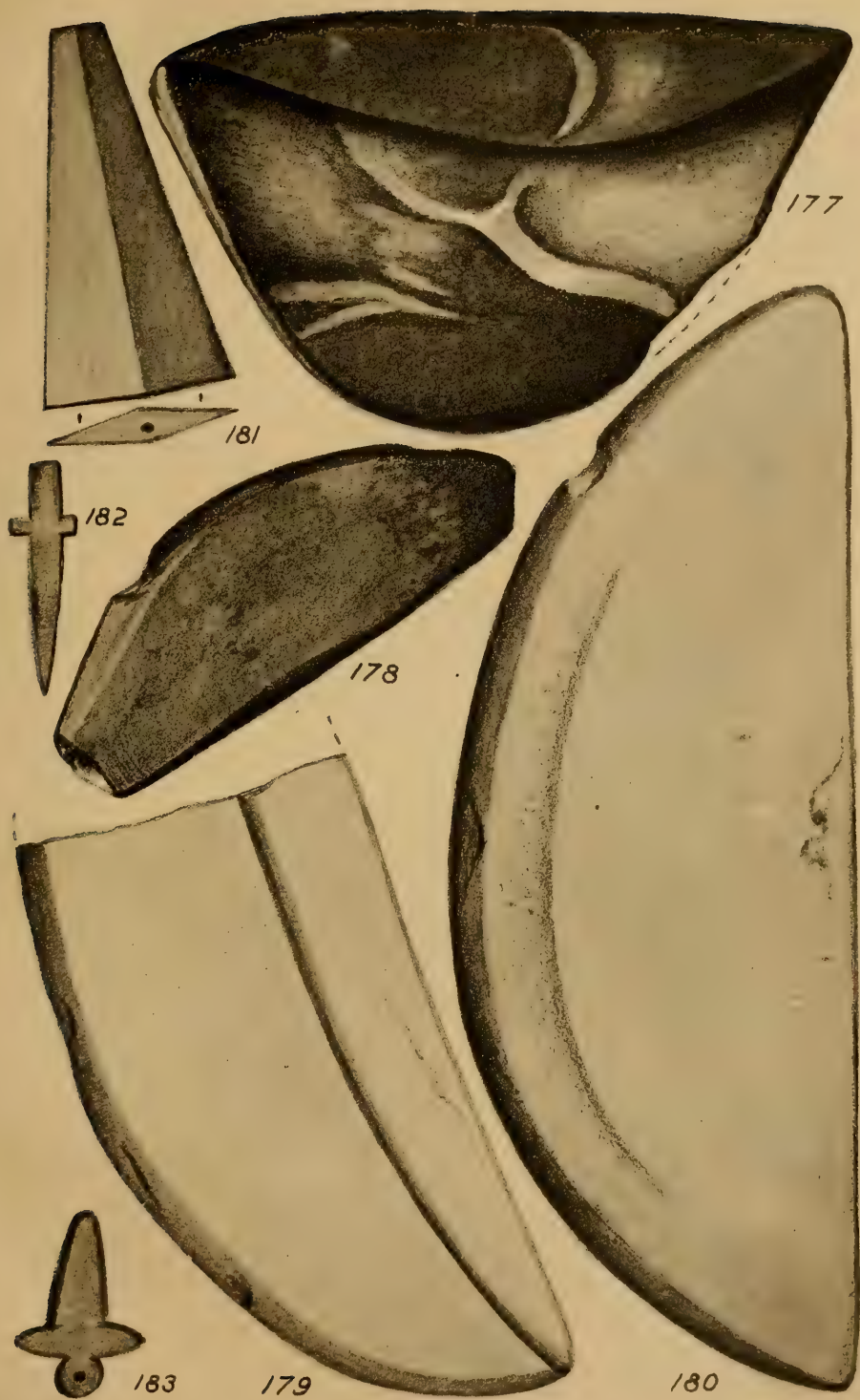
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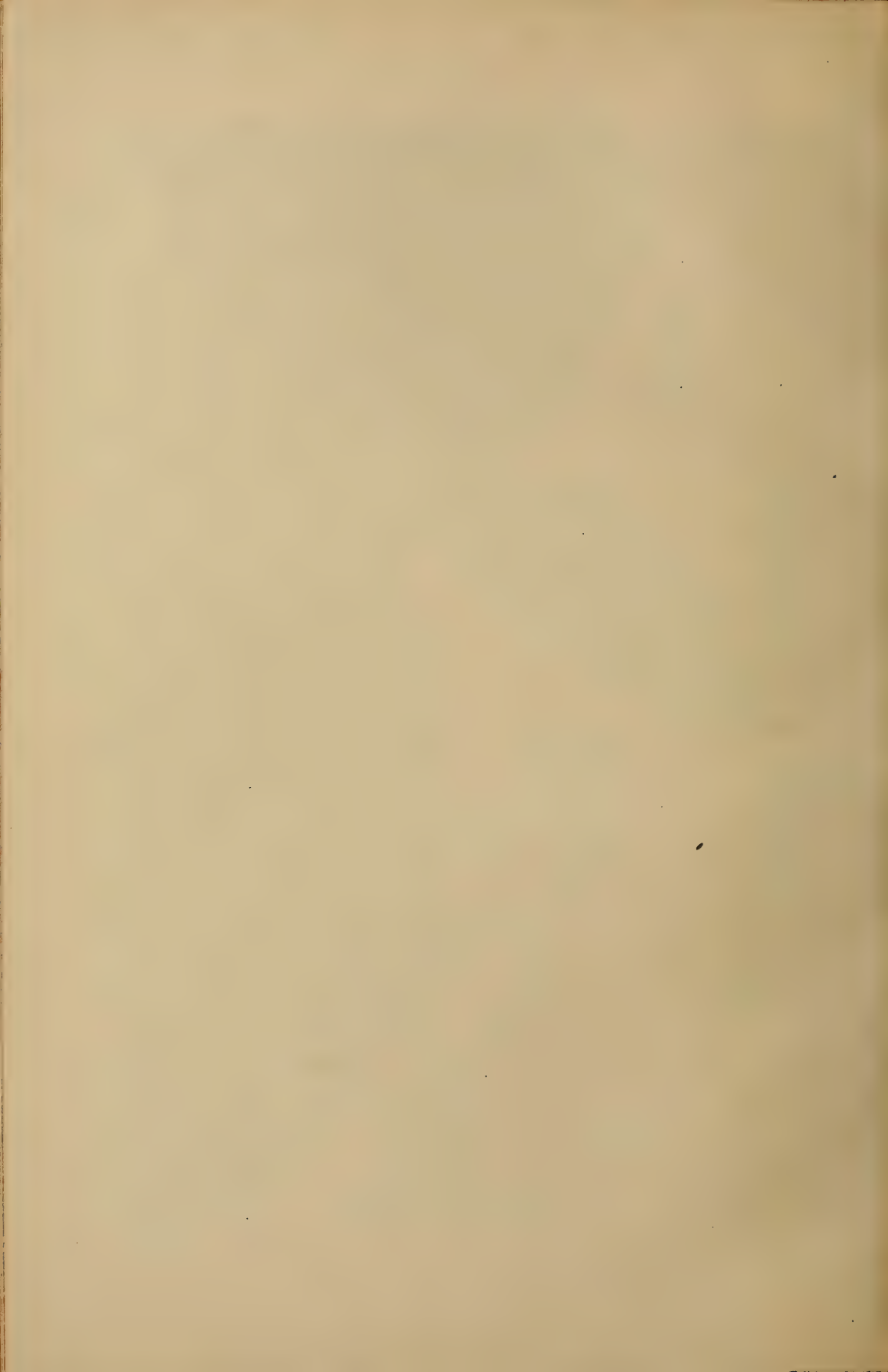
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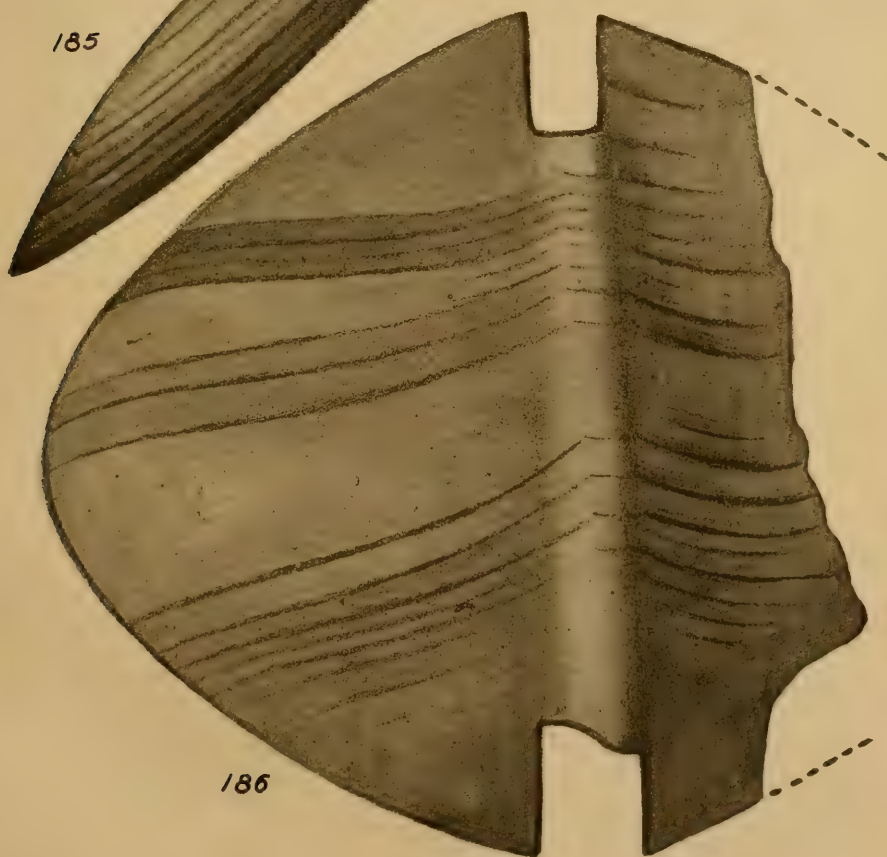


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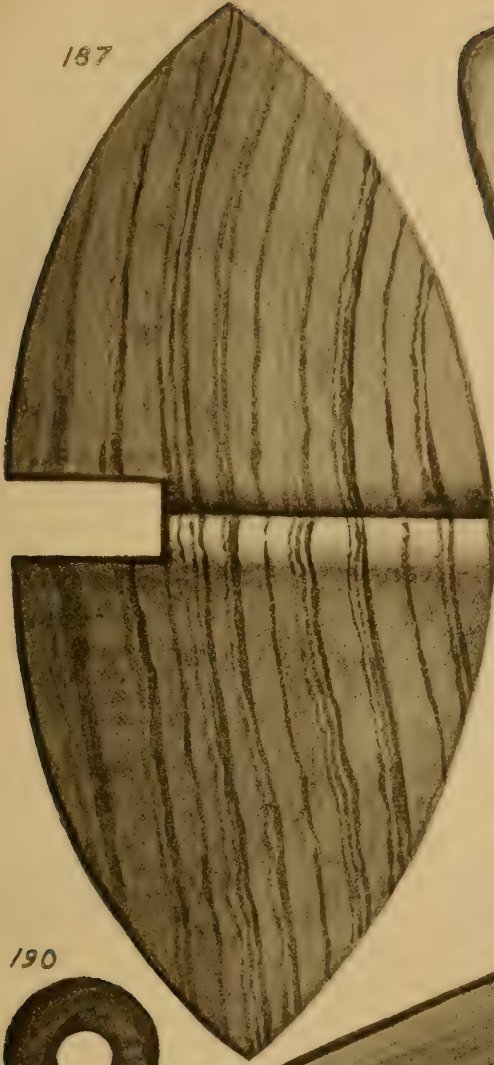




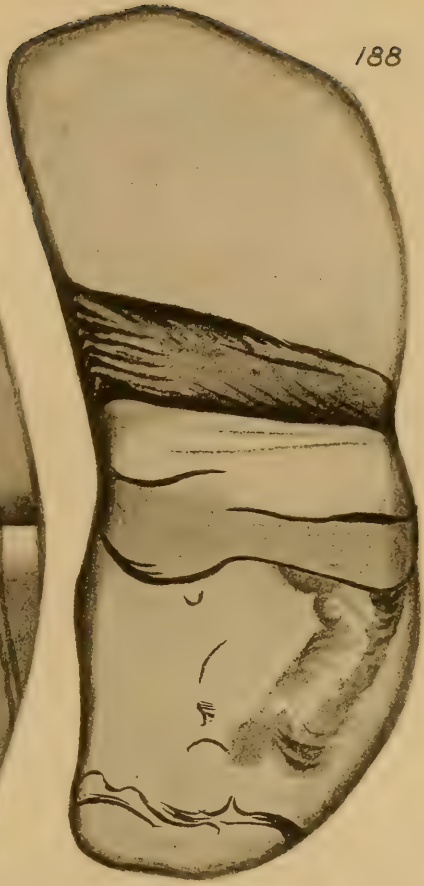


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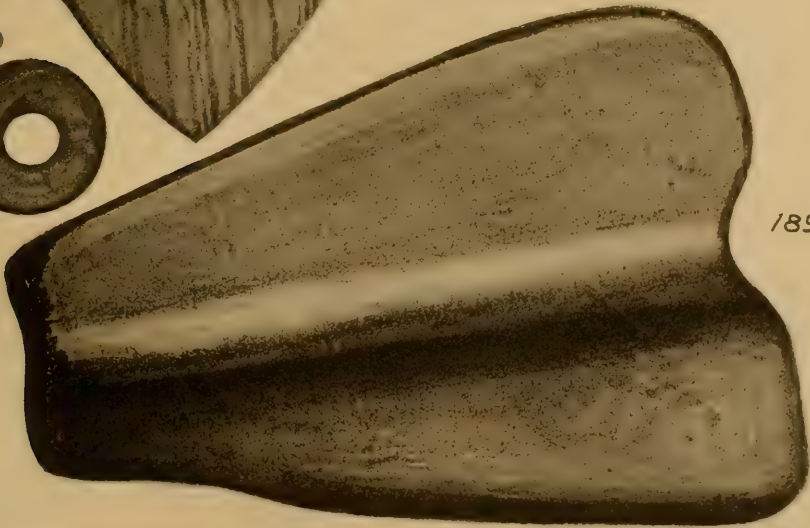
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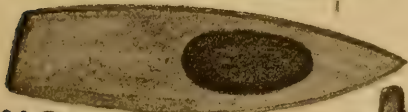
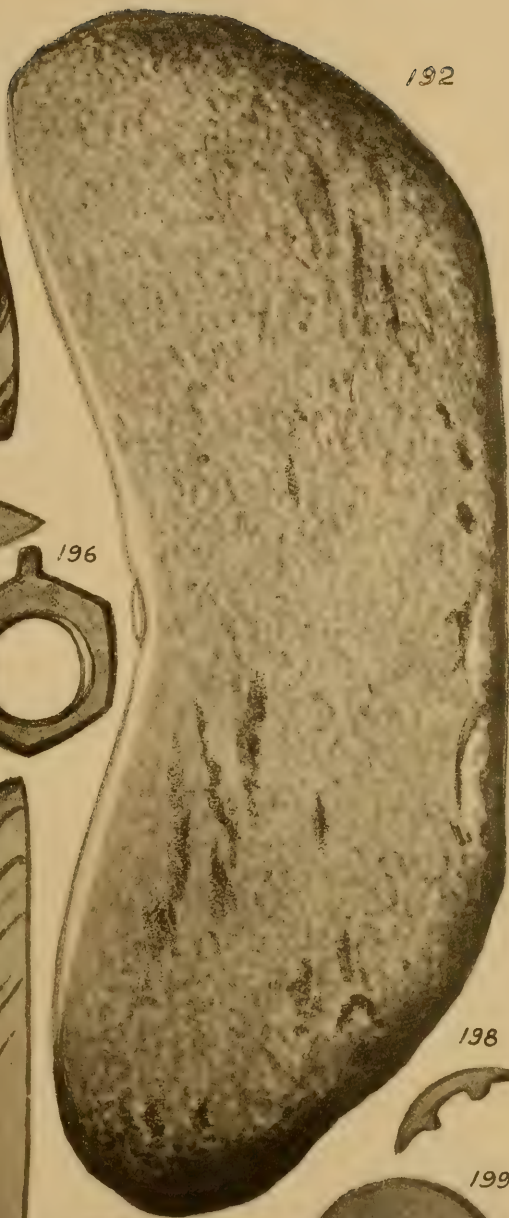
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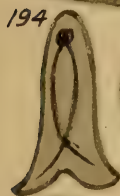
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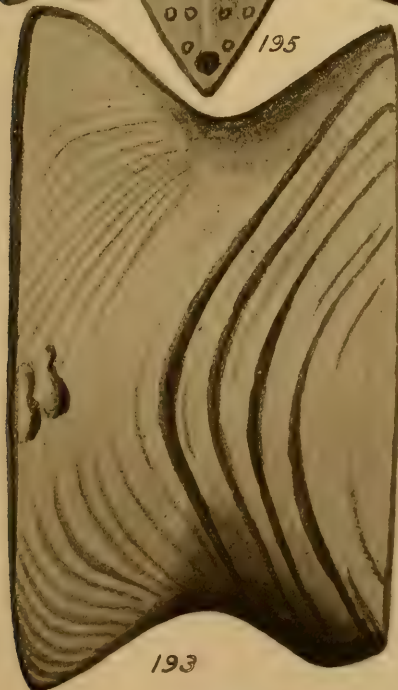
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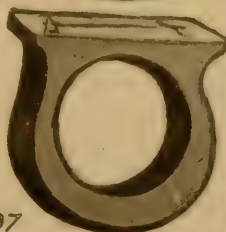
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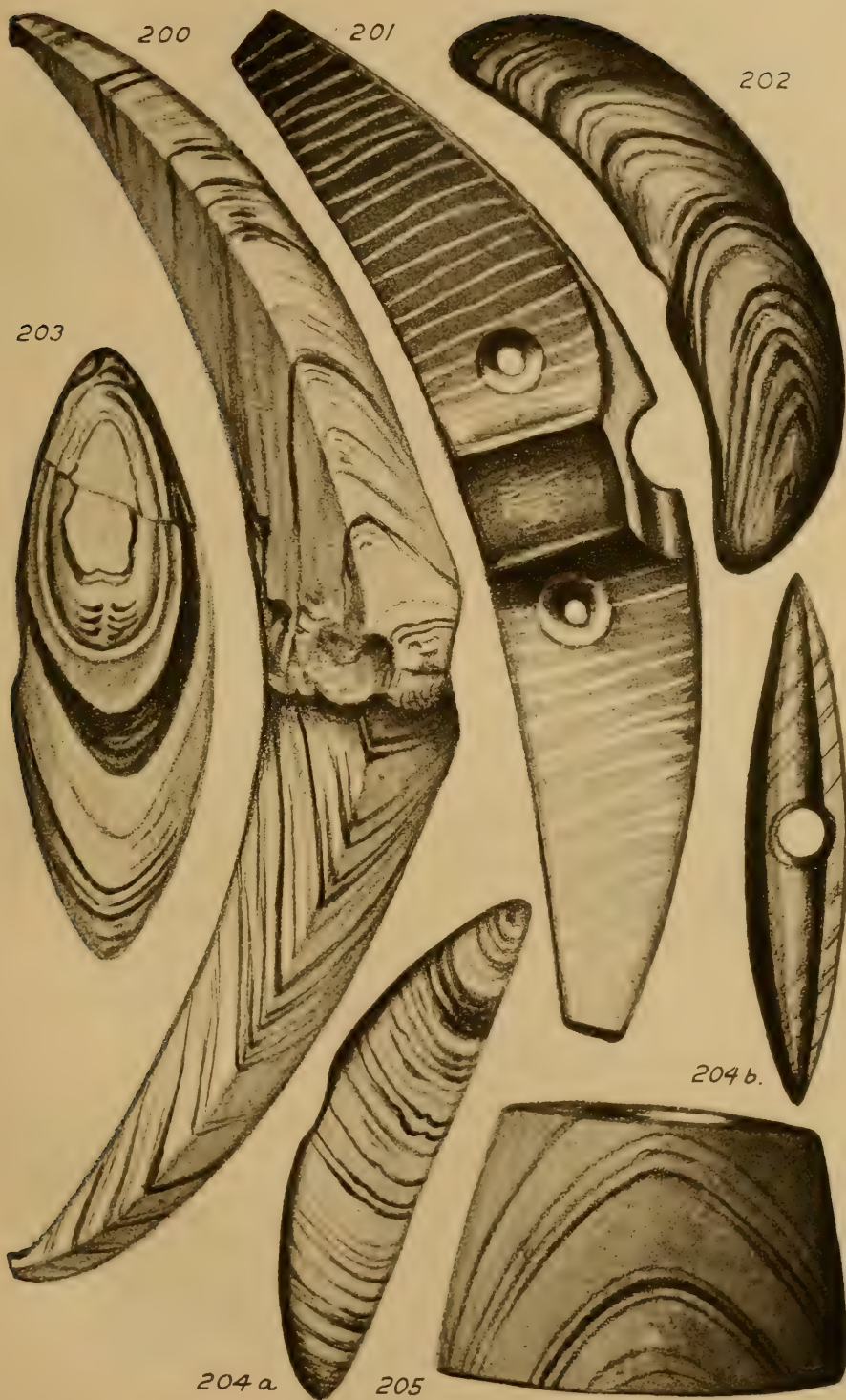
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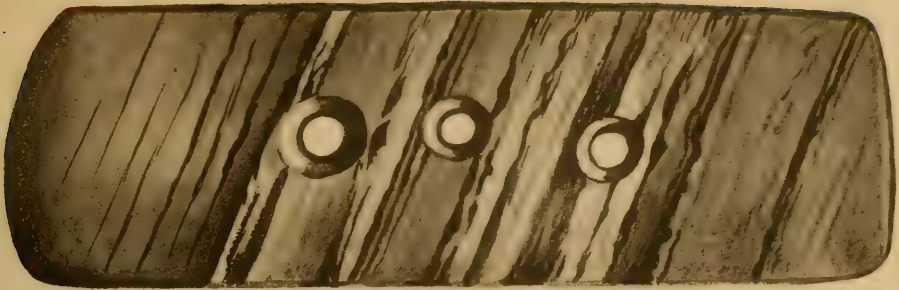
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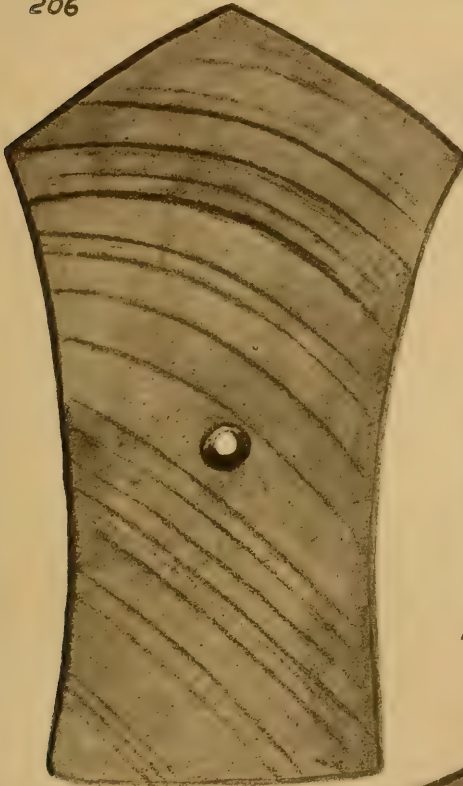
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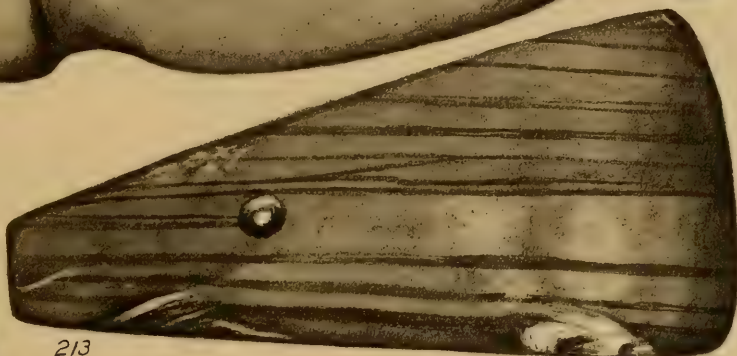


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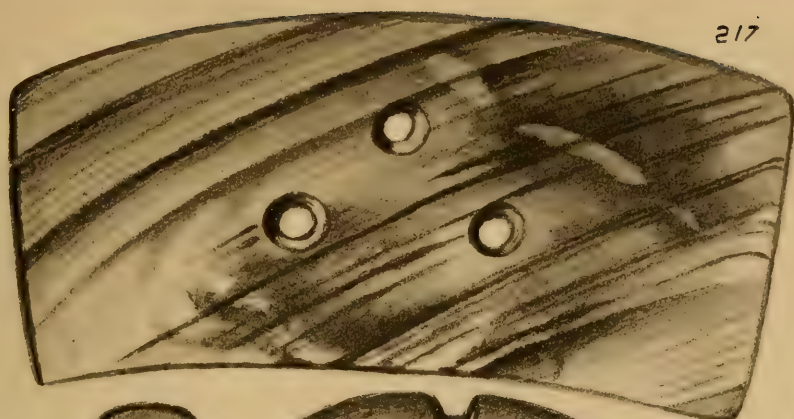
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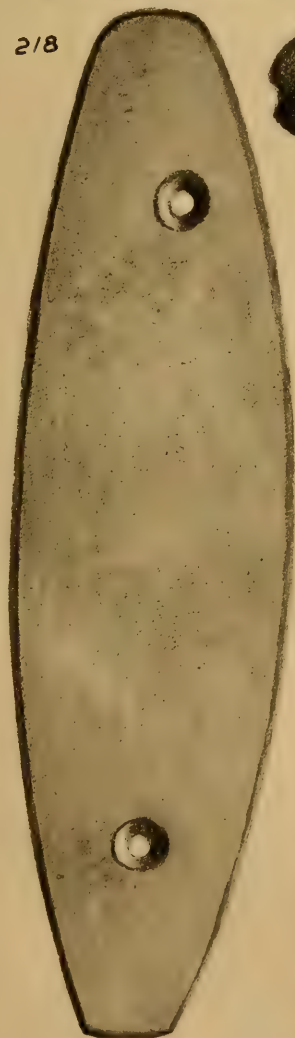
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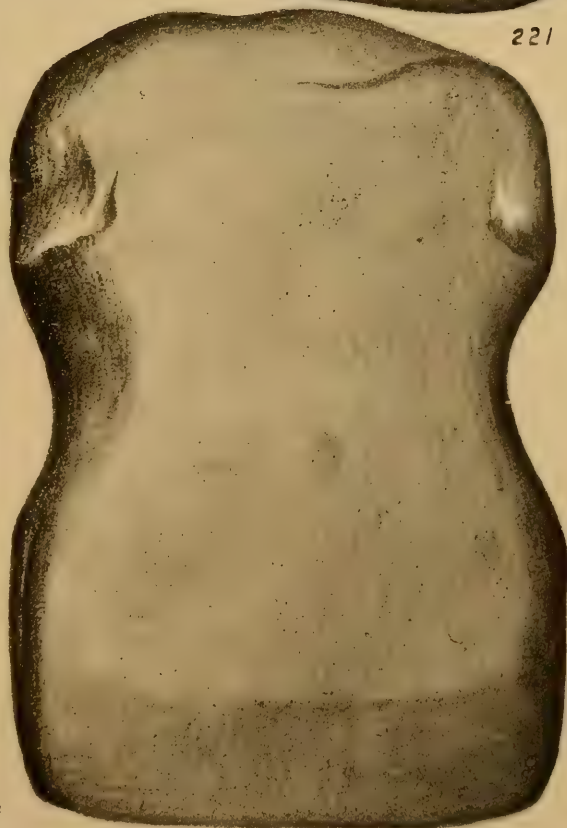
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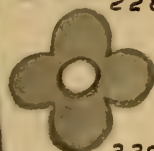
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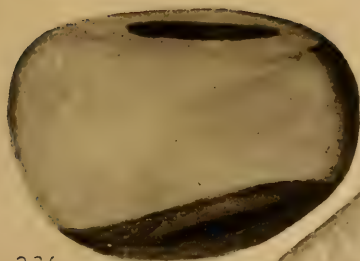


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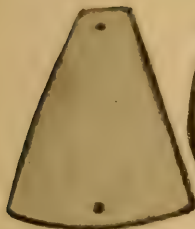


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